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clients and employees.*

9th Annual Ground Water Progress Report

GEMS Landfill

Gloucester Township, New Jersey

May 2015

Prepared for:
GEMS Phase II Trust



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REPORT CERTIFICATION

Ninth Annual Groundwater Progress Report

**GEMS Landfill
Gloucester Township, New Jersey**

The material and data in this report were prepared under the supervision and direction of the undersigned.

Cornerstone Environmental Group, LLC

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Senior Hydrogeologist

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1 INTRODUCTION

This progress report documents the performance of the groundwater extraction system at the GEMS Landfill (site) during the ninth year of operation (July 11, 2013 through July 10, 2014). The report has been prepared in accordance with Section 2.3 of the Remedial Action Work Plan (RAWP) for the Phase II remedial activities at the GEMS Landfill. The RAWP in turn, was developed pursuant to the Groundwater Performance Monitoring Program (GPMP) contained in Appendix G of the Consent Decree for the site. Modifications to the hydraulic monitoring portion of the RAWP were proposed in a July 18, 2003 correspondence to USEPA, and subsequently approved by both USEPA and NJDEP. These changes have been incorporated into the field monitoring activities.

2 GROUNDWATER EXTRACTION RATES

The groundwater extraction system began operation on July 11, 2005 and its operation was generally continuous throughout the ninth year with the exception of occasional downtime for routine maintenance, such as cleanout of the force main from the Holly Run Underdrain (HRU) sump to the treatment plant. Groundwater was pumped from four extraction wells (EX-1 through EX-4) and from the HRU near Manhole 4. As shown on **Figure 2-1**, the combined daily flow rate for the system generally varied between 120,000 and 170,000 gallons per day (gpd) with an average flow of 151,000 gpd during the year. A total of nearly 55 million gallons were extracted and treated during the ninth year of operation, the majority of which was derived from the HRU. This equates to an average continuous flow rate of approximately 105 gpm. Flow data are summarized in **Table 2-1**.

Pumping rates of the four extraction wells are shown on **Figure 2-2**. The cyclic pattern shown on **Figures 2-1 and 2-2** of relatively sharp increases in pumping rates, followed by slow declines is due to periodic jet-cleaning of the force main. After cleaning, flow within the force main is unrestricted and achieves its maximum rate. Through time however, the buildup of material within the pipe caused the flow rate to decline until such time that the water level in the Holly Run pumping station can no longer be maintained at the target level. Once this trigger level is met, the next force main cleaning is scheduled and the cycle repeats itself.

Individual average pumping rates ranged from approximately 3,500 gpd to 4,100 gpd for wells EX-1 and EX-2 to less than 800 gpd for wells EX-3 and EX-4. The annual average pumping rate for the combined flow from the four wells is approximately 8,400 gpd which is higher than last year.

To address the issue of declining pumping rates during prior years, GEMS Phase II Trust met with representatives of both NJDEP and USEPA in 2010 and, at their request, prepared a work plan to investigate groundwater quality downgradient of the extraction wells. The objective of this investigation, as it relates to the declining pumping rates, was to identify potential replacement extraction well locations in areas of the most elevated groundwater contamination. The work plan was submitted to the agencies in February. Initial comments were received from EPA on June 30, 2011 and responses were provided on July 7, 2011. In January 2013, the GEMS Trust notified EPA of their decision to implement the investigation on a voluntary basis. The first phase of the investigation was undertaken in late February, 2013, and was followed by several subsequent phases. The results were successful in delineating the approximate width of the downgradient plume which was found in greatest concentrations at a depth of approximately 40 feet below grade. The results of the initial investigation were presented in a report to the agencies in June 2013 which included recommendations to optimize the extent of the capture zone through the installation of a horizontal extraction well. After several rounds of comments and

modifications, a work plan was developed for the installation of the horizontal well which was approved by EPA on August 28, 2014.

3 GROUNDWATER ELEVATIONS AND CAPTURE ZONE

3.1 Manual Water Measurements

In accordance with the revised RAWP, manual groundwater level measurements were collected quarterly during the ninth year of operation and are summarized in **Table 3-1**. Data from the January 20, 2014 event are plotted as groundwater elevations above mean sea level on **Figure 3-1**. As shown on **Figure 3-2**, the monthly precipitation in January was close to the 30-year average. Annual precipitation during the reporting period was 42.75 inches which is also close to the annual average of 40.59 inches as reported for nearby Atlantic City, NJ for the same period.

The resulting groundwater capture zone, produced by pumping from the extraction wells and by intercepting groundwater discharge to the HRU, has been superimposed over the area by drawing groundwater flowlines perpendicular to the elevation contours. The capture zone encompasses the majority of landfill footprint with the exception of the southwest portion of the landfill, which, as further discussed in Section 4, did not contain VOCs above NJ Groundwater Quality Standards (NJGWQS) during the reporting period.

Due to the diminished yield of the extraction wells as discussed in section 2, the ability of the extraction system to provide a complete zone of capture between the pumping wells was further evaluated through groundwater flow model simulations. The MODFLOW model that has been established for the site was used to predict steady-state groundwater elevations based on the actual reported pumping rates for the four active extraction wells averaged over the 12-month reporting period (**Table 2-1**). The results are illustrated on **Figure 3-3**. Particle tracking was used to define the resulting capture zone by placing particles upgradient of the landfill and tracking them forward within the flow field to their ultimate discharge locations. The resulting pathlines indicate that although the western edge of the capture zone has shifted slightly to the east compared to prior years, groundwater within the contaminant plume boundary established in Appendix G of the Consent Decree is continuing to be contained by a combination of the HUR and extraction wells. A close-up of the predicted pathlines near the extraction wells is shown on **Figure 3-4** and confirms that there are no gaps in flow between the individual extraction wells.

3.2 Automatic Water Level Measurements

Automatic water level data recorders were placed in eleven monitoring wells to assess trends in groundwater level fluctuations. In accordance with the revised work plan, the following wells were monitored with data loggers: PM-5, PM-6, PM-9, PM-12, PM-15, PM-19, PM-21, PM-25, P-1, P-2, and P-3. Plots of groundwater elevations through time from each of the data loggers are provided in **Appendix A**. The results indicate a general increase in water levels during the third and fourth quarters of 2013, followed by a steady

decline in levels throughout the spring of 2014. The early summer of 2014 showed a return to declining water levels. The range of the seasonal fluctuation was on the order of 1.5 to 3 feet in most wells.

3.3 Swamp Pink Water Level Monitoring Data

The potential impact of pumping at the GEMS landfill on groundwater levels in the adjacent Swamp Pink colony (Colony III) was evaluated through a comparison of groundwater level hydrographs. Water level data collected by Cornerstone on the GEMS landfill site are contained in **Appendix A** and include wells P-1 and P-2 located approximately midway between the extraction wells and Colony III, and well P-3 located just west of Colony III. Water level data collected as part of the Swamp Pink Monitoring Program by CH2M Hill within Colony III and the control colony (Campus Colony) are provided in **Appendix B**. These data were obtained from shallow piezometers installed in each colony as shown on **Figures 1 and 2** in **Appendix B**. For each transect, piezometers are located in wetland (W), transition (T), and upland (U) areas.

The elevation of the groundwater table at P-1 and P-2, located between the GEMS site and Colony III, on January 20, 2014 is shown on **Figure 3-1**. A comparison of these levels to those measured just prior to pumping in July 2005 indicates that the water level was 0.55 and 0.18 feet higher, respectively, in January 2014 than prior to pumping. These data clearly indicate that water levels in and around Colony III have not been impacted by GEMS pumping. This conclusion is supported by hydrographs developed by CH2M Hill during implementation of the Swamp Pink Monitoring Plan. For example, **Figures 3 and 4** in **Appendix B** provide a long-term history of water level trends in the wetland piezometers at Colony III and the Campus Site, respectively, and indicate that pumping from the GEMS site has had no discernible impact on water levels at either colony.

4 GROUNDWATER QUALITY

In accordance with the Remedial Action Work Plan (RAWP) for the Phase II remedial activities, groundwater sampling has been conducted on a semi-annual basis during this ninth year of system operation. Sampling rounds were conducted in October 2013 and May 2014. A total of 22 monitoring wells were sampled during each event. Samples collected during both events were analyzed for the abbreviated list of parameters in accordance with the work plan and Appendix G of the Consent Decree. The following schedule illustrates the completed events and those planned for the future.

<u>Sample Date</u>	<u>Sample Event / Year of Operation</u>	<u>Constituents</u>	<u>Status</u>
October 2005	1 / 1 st Year	Full List	Completed
January 2006	2 / 1 st Year	Abbreviated List	Completed
April 2006	3 / 1 st Year	Abbreviated List	Completed
July 2006	4 / 1 st Year	Abbreviated List	Completed
March 2007	5 / 2 nd Year	Full List	Completed
September 2007	6 / 3 rd Year	Abbreviated List	Completed
April 2008	7 / 3 rd Year	Abbreviated List	Completed
September 2008	8 / 4 th Year	Abbreviated List	Completed
March 2009	9 / 4 th Year	Full List	Completed
October 2009	10 / 5 th Year	Abbreviated List	Completed
March 2010	11 / 5 th Year	Abbreviated List	Completed
September 2010	12 / 6 th Year	Abbreviated List	Completed
April 2011	13 / 6 th Year	Full List	Completed
September 2011	14 / 7 th Year	Abbreviated List	Completed
April 2012	15 / 7 th Year	Abbreviated List	Completed
October 2012	16 / 8 th Year	Abbreviated List	Completed
April 2013	17 / 8 th Year	Full List	Completed
October 2013	18 / 9th Year	Abbreviated List	Included in this Report
May 2014	19 / 9th Year	Abbreviated List	Included in this Report
Fall 2014	20 / 10 th Year	Abbreviated List	Tenth Year's Report
Spring 2015	21 / 10 th Year	Full List	Tenth Year's Report

A summary of the groundwater quality data compiled from these two events is provided in **Tables 4-1a and 4-1b**. Concentrations of volatile organic constituents (VOCs) and inorganic constituents that exceed the current NJGWQS have been shown in the table with bold font type and are plotted on **Figures 4-1 through 4-4**.

4.1 Organic Constituents

As illustrated in **Table 4-1a**, the VOCs that are most prevalent near the landfill include benzene and chlorobenzene. With the exception of the PM-19 well cluster, VOCs were detected in wells screened in the Lower Cohansey formation, with the corresponding Upper Cohansey well (e.g. PM-12 and PM-15) being generally clean.

Figures 4-1 and 4-2 indicate that VOCs were only detected above NJGWQS along northeastern edge of the landfill, in the vicinity of the operating extraction wells. This area includes Lower Cohansey wells PM 13, PM-16, and 102AR and Upper Cohansey well PM-19 (co located with 102AR). In addition to benzene, detected VOCs exceeding the NJGWQS in that area include chlorobenzene, chloroethane, 1,2 dichloroethane, and trichloroethene. Note that methylene chloride and vinyl chloride were detected above standards last year but were below standards during this ninth year.

Well PM-21 was added to the LTMP in March 2008 at USEPA's request to further assess the extent of potential vapor intrusion issues in the area. The well has since been sampled nine times and with one exception (March 2009), VOCs have not been detected above detection limits, including during this ninth year of operations. In the March 2009 event, only trichloroethene slightly exceeded the NJGWQS of 1 ppb at a reported concentration of 6.3 ppb. USEPA conducted its own vapor intrusion investigation in this area in March 2010 that included the collection of indoor air samples from selected homes east of the GEMS landfill in the vicinity of monitoring wells PM-19 and PM-21. Based on the results, USEPA has reported that no further investigations are warranted in this regard. Well PM-21 will continue to be monitored in the future.

4.2 Inorganic Constituents

Detections of inorganic parameters above their respective laboratory reporting limits and above NJGWQS are provided in **Table 4-1b** and plotted on **Figures 4-3 and 4-4** for the October 2013 and May 2014 sampling rounds, respectively. Note that for both sampling rounds in this reporting period, the "abbreviated" list of parameters only included arsenic, cadmium and chromium. Of the three constituents, arsenic was the most prevalent being detected above its criteria of 3 ppb in 7 monitoring wells during both events including the upgradient well 907A. Chromium was detected above its criteria of 70 ppb in well 1008S (both events), and cadmium was only detected in the upgradient well 907B.

4.3 Semi-Volatile Organic Constituents

Semi-volatile organic compounds were not analyzed in either the October 2013 or May 2014 sampling events in accordance with the RAWP.

4.4 Constituent Concentration Trends

Trends of various organic and inorganic constituents have been monitored through the collection of quarterly and then semi-annual groundwater samples. Time-series concentration plots have been prepared for selected monitoring wells and constituents that were above the NJGWQS. These plots are provided in **Appendix C** and indicate variable VOC trends during the reporting period. Benzene, for example, has declined in concentration along the western side of the landfill. In well PM-4, benzene declined from over 3 ppb to non-detect. PM-2 has not detected benzene above the NJGWQS since 2008. Wells along the east side of the landfill also report generally decreasing trends, such as benzene in PM-19 and 1,1-dichloroethene in PM-30. The one exception is benzene in well 102AR which increased from approximately 20 ppb to 50 ppb. In the northeastern corner of the site, where VOC concentrations are the most elevated, benzene, chlorobenzene, and xylene continue to show a general declining trend at PM-16 and PM 13.

With respect to inorganic constituents, the majority of the plots indicate relatively flat trends with only minor variations typical of seasonal changes in groundwater quality.

5 SUMMARY

The groundwater extraction system at the GEMS landfill removed and treated close to 55 million gallons of groundwater during its ninth year of operation and totals approximately 465 million gallons since startup on July 11, 2005. Pumping from the four extraction wells, albeit at rates below initial design rates, continues to depress the groundwater surface around the northeastern end of the landfill. This depression, along with the interception of flow from the Holly Run Underdrain, creates a capture zone that encompasses the contaminant plume boundary. Regarding the issue of well yield, the GEMS Phase II Trust has obtained approval for the installation of a horizontal extraction well that will target elevated groundwater concentration areas and improve system performance and pumping rates. Regarding the issue of the downgradient extent of the plume, the GEMS Phase II Trust is continuing to conducted off-site groundwater investigation in order to update the groundwater classification Exception Area (CEA) as required by the Consent Decree. Finally, groundwater level monitoring west of the site has shown that drawdown from the GEMS extraction wells has not impacted water levels in Swamp Pink Colony III. Independent data collected from the Swamp Pink monitoring program supports this conclusion.

LIMITATIONS

The work product included in the attached was undertaken in full conformity with generally accepted professional consulting principles and practices and to the fullest extent as allowed by law we expressly disclaim all warranties, express or implied, including warranties of merchantability or fitness for a particular purpose. The work product was completed in full conformity with the contract with our client and this document is solely for the use and reliance of our client (unless previously agreed upon that a third party could rely on the work product) and any reliance on this work product by an unapproved outside party is at such party's risk.

The work product herein (including opinions, conclusions, suggestions, etc.) was prepared based on the situations and circumstances as found at the time, location, scope and goal of our performance and thus should be relied upon and used by our client recognizing these considerations and limitations. Cornerstone shall not be liable for the consequences of any change in environmental standards, practices, or regulations following the completion of our work and there is no warrant to the veracity of information provided by third parties, or the partial utilization of this work product.

TABLES

TABLE 2-1
SUMMARY OF PUMPING DATA
GEMS Landfill Phase II Project

Date:	Groundwater Extraction Wells					Holly Run Underdrain	Total Volume Collected
	EX-1 (gallons)	EX-2 (gallons)	EX-3 (gallons)	EX-4 (gallons)	Total Wells Only	(gallons)	(gallons)
11-Jul-13	5800	3100	300	500	9700	158100	167800
12-Jul-13	6033	3133	267	533	9967	167400	177367
13-Jul-13	6033	3133	267	533	9967	167400	177367
14-Jul-13	6033	3133	267	533	9967	167400	177367
15-Jul-13	5600	3100	200	500	9400	156800	166200
16-Jul-13	5100	3100	300	500	9000	153300	162300
17-Jul-13	6500	3000	300	600	10400	157200	167600
18-Jul-13	6200	3100	300	500	10100	161600	171700
19-Jul-13	4367	2933	233	100	7633	157433	165067
20-Jul-13	4367	2933	233	100	7633	157433	165067
21-Jul-13	4367	2933	233	100	7633	157433	165067
22-Jul-13	4400	3100	300	100	7900	156300	164200
23-Jul-13	4300	3100	200	600	8200	144900	153100
24-Jul-13	4400	3000	300	300	8000	143800	151800
25-Jul-13	4300	3000	200	600	8100	144400	152500
26-Jul-13	4433	3033	267	600	8333	125900	134233
27-Jul-13	4433	3033	267	600	8333	125900	134233
28-Jul-13	4433	3033	267	600	8333	125900	134233
29-Jul-13	4400	3000	300	500	8200	171200	179400
30-Jul-13	3300	2200	200	300	6000	151900	157900
31-Jul-13	4600	3100	300	500	8500	167700	176200
1-Aug-13	4400	3100	200	600	8300	166700	175000
2-Aug-13	4400	3000	233	267	7900	150300	158200
3-Aug-13	4400	3000	233	267	7900	150300	158200
4-Aug-13	4400	3000	233	267	7900	150300	158200
5-Aug-13	5000	3000	300	500	8800	141900	150700
6-Aug-13	4500	2900	300	300	8000	137000	145000
7-Aug-13	4300	3000	200	400	7900	151700	159600
8-Aug-13	4400	3000	300	300	8000	149000	157000
9-Aug-13	4367	2933	267	500	8067	143833	151900
10-Aug-13	4367	2933	267	500	8067	143833	151900
11-Aug-13	4367	2933	267	500	8067	143833	151900
12-Aug-13	4200	3000	200	500	7900	141900	149800
13-Aug-13	4300	3000	300	500	8100	155200	163300
14-Aug-13	4300	3000	200	500	8000	156100	164100
15-Aug-13	4400	3100	300	500	8300	145400	153700
16-Aug-13	4300	3067	233	300	7900	141133	149033
17-Aug-13	4300	3067	233	300	7900	141133	149033
18-Aug-13	4300	3067	233	300	7900	141133	149033
19-Aug-13	4300	3100	300	100	7800	142200	150000
20-Aug-13	4300	3100	300	400	8100	138700	146800
21-Aug-13	4300	3100	200	100	7700	152000	159700
22-Aug-13	4200	3100	500	200	8000	180900	188900
23-Aug-13	4300	3133	233	133	7800	140267	148067
24-Aug-13	4300	3133	233	133	7800	140267	148067
25-Aug-13	4300	3133	233	133	7800	140267	148067
26-Aug-13	3300	2300	200	200	6000	130600	136600
27-Aug-13	4300	3200	200	100	7800	162200	170000
28-Aug-13	4300	3200	300	700	8500	161900	170400
29-Aug-13	4300	3200	300	200	8000	161700	169700
30-Aug-13	4275	3275	225	100	7875	154825	162700
31-Aug-13	4275	3275	225	100	7875	154825	162700
1-Sep-13	4275	3275	225	100	7875	154825	162700
2-Sep-13	4275	3275	225	100	7875	154825	162700
3-Sep-13	4200	3300	200	100	7800	159800	167600
4-Sep-13	4400	3400	300	600	8700	155000	163700
5-Sep-13	4200	3200	200	500	8100	143500	151600
6-Sep-13	4200	3333	233	600	8367	162933	171300

TABLE 2-1
SUMMARY OF PUMPING DATA
GEMS Landfill Phase II Project

Page 2

Date:	Groundwater Extraction Wells					Holly Run Underdrain	Total Volume Collected
	EX-1 (gallons)	EX-2 (gallons)	EX-3 (gallons)	EX-4 (gallons)	Total Wells Only	(gallons)	(gallons)
7-Sep-13	4200	3333	233	600	8367	162933	171300
8-Sep-13	4200	3333	233	600	8367	162933	171300
9-Sep-13	3100	2600	200	400	6300	121100	127400
10-Sep-13	4300	3700	200	600	8800	157900	166700
11-Sep-13	4200	3600	300	600	8700	146900	155600
12-Sep-13	4100	3600	200	600	8500	144400	152900
13-Sep-13	4200	3500	233	567	8500	139667	148167
14-Sep-13	4200	3500	233	567	8500	139667	148167
15-Sep-13	4200	3500	233	567	8500	139667	148167
16-Sep-13	4100	3300	200	600	8200	164700	172900
17-Sep-13	4100	3600	300	600	8600	166200	174800
18-Sep-13	4200	4300	200	600	9300	170100	179400
19-Sep-13	4100	4200	200	500	9000	164400	173400
20-Sep-13	4033	4067	233	567	8900	177167	186067
21-Sep-13	4033	4067	233	567	8900	177167	186067
22-Sep-13	4033	4067	233	567	8900	177167	186067
23-Sep-13	4000	4100	300	500	8900	152900	161800
24-Sep-13	4000	3900	200	600	8700	167200	175900
25-Sep-13	4000	4000	200	500	8700	161400	170100
26-Sep-13	4000	4100	300	500	8900	149300	158200
27-Sep-13	3933	4067	267	533	8800	153967	162767
28-Sep-13	3933	4067	267	533	8800	153967	162767
29-Sep-13	3933	4067	267	533	8800	153967	162767
30-Sep-13	3400	4200	200	500	8300	151600	159900
1-Oct-13	3600	4000	200	500	8300	99700	108000
2-Oct-13	3900	4200	300	500	8900	151600	160500
3-Oct-13	4100	4500	200	600	9400	147000	156400
4-Oct-13	3800	4000	233	500	8533	130293	138827
5-Oct-13	3800	4000	233	500	8533	130293	138827
6-Oct-13	3800	4000	233	500	8533	130293	138827
7-Oct-13	3300	3100	200	400	7000	116000	123000
8-Oct-13	3600	3900	300	500	8300	144600	152900
9-Oct-13	3100	3500	200	400	7200	106700	113900
10-Oct-13	4200	4400	200	500	9300	156700	166000
11-Oct-13	3900	4133	233	533	8800	137367	146167
12-Oct-13	3900	4133	233	533	8800	137367	146167
13-Oct-13	3900	4133	233	533	8800	137367	146167
14-Oct-13	3600	3900	300	500	8300	118900	127200
15-Oct-13	4400	4600	200	600	9800	139100	148900
16-Oct-13	3300	3500	200	400	7400	104200	111600
17-Oct-13	4000	4200	300	500	9000	129900	138900
18-Oct-13	3867	4000	233	500	8600	123033	131633
19-Oct-13	3867	4000	233	500	8600	123033	131633
20-Oct-13	3867	4000	233	500	8600	123033	131633
21-Oct-13	3800	3900	200	500	8400	117300	125700
22-Oct-13	4400	4300	300	600	9600	131400	141000
23-Oct-13	3500	3400	200	400	7500	103700	111200
24-Oct-13	4400	4300	200	600	9500	122300	131800
25-Oct-13	3900	4033	233	533	8700	104933	113633
26-Oct-13	3900	4033	233	533	8700	104933	113633
27-Oct-13	3900	4033	233	533	8700	104933	113633
28-Oct-13	3900	4100	300	500	8800	96200	105000
29-Oct-13	3300	4100	200	500	8100	99900	108000
30-Oct-13	2700	2900	200	400	6200	73200	79400
31-Oct-13	3900	4600	200	600	9300	103300	112600
1-Nov-13	3567	3800	200	500	8067	103433	111500
2-Nov-13	3567	3800	200	500	8067	103433	111500
3-Nov-13	3567	3800	200	500	8067	103433	111500

TABLE 2-1
SUMMARY OF PUMPING DATA
GEMS Landfill Phase II Project

Date:	Groundwater Extraction Wells					Holly Run Underdrain	Total Volume Collected
	EX-1 (gallons)	EX-2 (gallons)	EX-3 (gallons)	EX-4 (gallons)	Total Wells Only	(gallons)	(gallons)
4-Nov-13	3400	3700	200	600	7900	96900	104800
5-Nov-13	2600	2900	200	400	6100	112500	118600
6-Nov-13	3700	4000	200	500	8400	130000	138400
7-Nov-13	3700	4000	200	500	8400	128000	136400
8-Nov-13	3633	4000	200	533	8367	125433	133800
9-Nov-13	3633	4000	200	533	8367	125433	133800
10-Nov-13	3633	4000	200	533	8367	125433	133800
11-Nov-13	3600	3900	200	500	8200	125900	134100
12-Nov-13	3600	4000	200	600	8400	128200	136600
13-Nov-13	3500	3900	200	500	8100	125400	133500
14-Nov-13	3500	4000	200	500	8200	132200	140400
15-Nov-13	3600	4033	200	33	7867	135367	143233
16-Nov-13	3600	4033	200	33	7867	135367	143233
17-Nov-13	3600	4033	200	33	7867	135367	143233
18-Nov-13	3400	3900	200	500	8000	119900	127900
19-Nov-13	3500	3900	200	500	8100	114100	122200
20-Nov-13	3500	3900	200	600	8200	115900	124100
21-Nov-13	3500	3900	200	500	8100	110400	118500
22-Nov-13	3433	3867	200	500	8000	117100	125100
23-Nov-13	3433	3867	200	500	8000	117100	125100
24-Nov-13	3433	3867	200	500	8000	117100	125100
25-Nov-13	3500	3900	200	500	8100	121800	129900
26-Nov-13	3500	4100	200	500	8300	142600	150900
27-Nov-13	3420	4100	200	560	8280	128640	136920
28-Nov-13	3420	4100	200	560	8280	128640	136920
29-Nov-13	3420	4100	200	560	8280	128640	136920
30-Nov-13	3420	4100	200	560	8280	128640	136920
1-Dec-13	3420	4100	200	560	8280	128640	136920
2-Dec-13	3600	4000	200	500	8300	123100	131400
3-Dec-13	3500	4200	200	600	8500	130900	139400
4-Dec-13	3400	4400	200	500	8500	134800	143300
5-Dec-13	3500	4200	200	500	8400	128100	136500
6-Dec-13	3467	4200	200	533	8400	131767	140167
7-Dec-13	3467	4200	200	533	8400	131767	140167
8-Dec-13	3467	4200	200	533	8400	131767	140167
9-Dec-13	3400	4000	200	500	8100	157500	165600
10-Dec-13	3400	4100	200	500	8200	154200	162400
11-Dec-13	2500	3000	100	400	6000	111400	117400
12-Dec-13	3400	4200	200	500	8300	131500	139800
13-Dec-13	3333	4167	200	467	8167	131900	140067
14-Dec-13	3333	4167	200	467	8167	131900	140067
15-Dec-13	3333	4167	200	467	8167	131900	140067
16-Dec-13	3600	4600	100	500	8800	136300	145100
17-Dec-13	3400	4400	200	500	8500	130000	138500
18-Dec-13	3400	4500	200	500	8600	137400	146000
19-Dec-13	3500	4400	200	600	8700	143900	152600
20-Dec-13	3467	4467	200	500	8633	149533	158167
21-Dec-13	3467	4467	200	500	8633	149533	158167
22-Dec-13	3467	4467	200	500	8633	149533	158167
23-Dec-13	3600	4400	200	500	8700	140000	148700
24-Dec-13	3450	4400	200	550	8600	125050	133650
25-Dec-13	3450	4400	200	550	8600	125050	133650
26-Dec-13	3500	4300	200	500	8500	118000	126500
27-Dec-13	3433	4300	200	533	8467	131233	139700
28-Dec-13	3433	4300	200	533	8467	131233	139700
29-Dec-13	3433	4300	200	533	8467	131233	139700
30-Dec-13	3500	4400	200	500	8600	116800	125400
31-Dec-13	3400	4300	200	500	8400	119400	127800

TABLE 2-1
SUMMARY OF PUMPING DATA
GEMS Landfill Phase II Project

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Date:	Groundwater Extraction Wells					Holly Run Underdrain	Total Volume Collected
	EX-1 (gallons)	EX-2 (gallons)	EX-3 (gallons)	EX-4 (gallons)	Total Wells Only	(gallons)	(gallons)
1-Jan-14	3400	4300	200	500	8400	119400	127800
2-Jan-14	3700	4600	300	700	9300	133900	143200
3-Jan-14	3300	4200	200	533	8233	122100	130333
4-Jan-14	3300	4200	200	533	8233	122100	130333
5-Jan-14	3300	4200	200	533	8233	122100	130333
6-Jan-14	3300	3800	200	500	7800	131300	139100
7-Jan-14	3400	4000	200	400	8000	132400	140400
8-Jan-14	3400	4000	0	400	7800	105900	113700
9-Jan-14	3600	4200	0	500	8300	105400	113700
10-Jan-14	3367	3900	0	533	7800	125100	132900
11-Jan-14	3367	3900	0	533	7800	125100	132900
12-Jan-14	3367	3900	0	533	7800	125100	132900
13-Jan-14	3500	3600	0	600	7700	122100	129800
14-Jan-14	3300	3700	100	500	7600	115100	122700
15-Jan-14	2600	2400	200	500	5700	133500	139200
16-Jan-14	3400	5400	200	500	9500	129600	139100
17-Jan-14	3367	4500	200	600	8667	126900	135567
18-Jan-14	3367	4500	200	600	8667	126900	135567
19-Jan-14	3367	4500	200	600	8667	126900	135567
20-Jan-14	3300	4500	200	600	8600	130000	138600
21-Jan-14	3400	4500	200	500	8600	138200	146800
22-Jan-14	3500	4500	300	600	8900	135900	144800
23-Jan-14	3300	4400	200	600	8500	124100	132600
24-Jan-14	3300	4367	200	567	8433	128033	136467
25-Jan-14	3300	4367	200	567	8433	128033	136467
26-Jan-14	3300	4367	200	567	8433	128033	136467
27-Jan-14	3400	4400	200	600	8600	121000	129600
28-Jan-14	3300	4400	200	600	8500	116000	124500
29-Jan-14	3300	4000	200	600	8100	110300	118400
30-Jan-14	3300	3800	200	500	7800	111000	118800
31-Jan-14	3333	3800	233	600	7967	118533	126500
1-Feb-14	3333	3800	233	600	7967	118533	126500
2-Feb-14	3333	3800	233	600	7967	118533	126500
3-Feb-14	3300	4000	200	600	8100	154500	162600
4-Feb-14	3300	4100	200	500	8100	130800	138900
5-Feb-14	3400	4300	200	600	8500	141800	150300
6-Feb-14	3300	4300	200	600	8400	151000	159400
7-Feb-14	3333	4400	233	600	8567	138833	147400
8-Feb-14	3333	4400	233	600	8567	138833	147400
9-Feb-14	3333	4400	233	600	8567	138833	147400
10-Feb-14	3300	4400	200	600	8500	124100	132600
11-Feb-14	3300	4500	200	500	8500	117900	126400
12-Feb-14	3400	4500	200	600	8700	135600	144300
13-Feb-14	3400	4500	200	600	8700	135600	144300
14-Feb-14	3333	4500	233	533	8600	136800	145400
15-Feb-14	3333	4500	233	533	8600	136800	145400
16-Feb-14	3333	4500	233	533	8600	136800	145400
17-Feb-14	2500	1800	100	600	5000	145000	150000
18-Feb-14	3300	4700	200	500	8700	141600	150300
19-Feb-14	3400	4200	300	700	8600	144400	153000
20-Feb-14	3400	4000	200	600	8200	144200	152400
21-Feb-14	3400	4133	200	600	8333	149833	158167
22-Feb-14	3400	4133	200	600	8333	149833	158167
23-Feb-14	3400	4133	200	600	8333	149833	158167
24-Feb-14	3500	4100	200	600	8400	153500	161900
25-Feb-14	3400	4000	300	600	8300	145300	153600
26-Feb-14	3400	3800	300	700	8200	155600	163800
27-Feb-14	3300	3700	200	600	7800	160700	168500

TABLE 2-1
SUMMARY OF PUMPING DATA
GEMS Landfill Phase II Project

Date:	Groundwater Extraction Wells					Holly Run Underdrain	Total Volume Collected
	EX-1 (gallons)	EX-2 (gallons)	EX-3 (gallons)	EX-4 (gallons)	Total Wells Only	(gallons)	(gallons)
28-Feb-14	3300	3500	200	600	7600	153033	160633
1-Mar-14	3300	3500	200	600	7600	153033	160633
2-Mar-14	3300	3500	200	600	7600	153033	160633
3-Mar-14	3400	3800	300	600	8100	144900	153000
4-Mar-14	3300	3600	200	700	7800	141800	149600
5-Mar-14	3200	3800	200	600	7800	138800	146600
6-Mar-14	3400	3700	200	700	8000	140700	148700
7-Mar-14	3233	3633	233	633	7733	129967	137700
8-Mar-14	3233	3633	233	633	7733	129967	137700
9-Mar-14	3233	3633	233	633	7733	129967	137700
10-Mar-14	3300	1000	200	700	5200	135500	140700
11-Mar-14	3200	4000	200	700	8100	128400	136500
12-Mar-14	3300	4800	200	700	9000	133800	142800
13-Mar-14	3200	4500	200	600	8500	128800	137300
14-Mar-14	3300	4333	200	667	8500	122867	131367
15-Mar-14	3300	4333	200	667	8500	122867	131367
16-Mar-14	3300	4333	200	667	8500	122867	131367
17-Mar-14	3100	100	300	600	4100	123500	127600
18-Mar-14	3200	0	200	600	4000	147700	151700
19-Mar-14	2600	2600	100	600	5900	149300	155200
20-Mar-14	3300	3900	300	600	8100	160600	168700
21-Mar-14	3233	3700	200	667	7800	153133	160933
22-Mar-14	3233	3700	200	667	7800	153133	160933
23-Mar-14	3233	3700	200	667	7800	153133	160933
24-Mar-14	3300	3600	200	600	7700	153800	161500
25-Mar-14	3200	3500	200	700	7600	164800	172400
26-Mar-14	3200	3800	200	600	7800	152200	160000
27-Mar-14	3200	3700	200	700	7800	168100	175900
28-Mar-14	3200	3800	233	300	7533	143300	150833
29-Mar-14	3200	3800	233	300	7533	143300	150833
30-Mar-14	3200	3800	233	300	7533	143300	150833
31-Mar-14	3200	3600	200	700	7700	140100	147800
1-Apr-14	3200	3500	200	200	7100	145400	152500
2-Apr-14	3300	3700	200	200	7400	144000	151400
3-Apr-14	3300	3700	200	300	7500	139800	147300
4-Apr-14	3367	3700	200	167	7433	150733	158167
5-Apr-14	3367	3700	200	167	7433	150733	158167
6-Apr-14	3367	3700	200	167	7433	150733	158167
7-Apr-14	3300	3500	300	800	7900	121100	129000
8-Apr-14	3300	3500	200	600	7600	172400	180000
9-Apr-14	3300	3500	200	600	7600	130400	138000
10-Apr-14	3300	3200	200	700	7400	190700	198100
11-Apr-14	3367	3133	200	700	7400	173067	180467
12-Apr-14	3367	3133	200	700	7400	173067	180467
13-Apr-14	3367	3133	200	700	7400	173067	180467
14-Apr-14	3300	3000	200	800	7300	177200	184500
15-Apr-14	3200	2900	300	700	7100	171000	178100
16-Apr-14	3400	3000	200	700	7300	144300	151600
17-Apr-14	3300	2800	200	700	7000	159900	166900
18-Apr-14	3400	2833	233	700	7167	160133	167300
19-Apr-14	3400	2833	233	700	7167	160133	167300
20-Apr-14	3400	2833	233	700	7167	160133	167300
21-Apr-14	3300	2600	200	700	6800	150600	157400
22-Apr-14	3300	2600	200	700	6800	129600	136400
23-Apr-14	3300	5400	200	700	9600	183600	193200
24-Apr-14	3300	5200	200	700	9400	164400	173800
25-Apr-14	3267	5267	200	667	9400	171767	181167
26-Apr-14	3267	5267	200	667	9400	171767	181167

TABLE 2-1
SUMMARY OF PUMPING DATA
GEMS Landfill Phase II Project

Date:	Groundwater Extraction Wells					Holly Run Underdrain	Total Volume Collected
	EX-1 (gallons)	EX-2 (gallons)	EX-3 (gallons)	EX-4 (gallons)	Total Wells Only	(gallons)	(gallons)
27-Apr-14	3267	5267	200	667	9400	171767	181167
28-Apr-14	3200	5200	200	700	9300	139100	148400
29-Apr-14	2400	5300	200	500	8400	158400	166800
30-Apr-14	3300	6500	300	700	10800	154000	164800
1-May-14	3700	8600	200	800	13300	167700	181000
2-May-14	3133	7767	200	433	11533	145300	156833
3-May-14	3133	7767	200	433	11533	145300	156833
4-May-14	3133	7767	200	433	11533	145300	156833
5-May-14	3300	7300	200	700	11500	139000	150500
6-May-14	3300	7200	300	800	11600	163500	175100
7-May-14	3300	6900	200	700	11100	137800	148900
8-May-14	3200	6700	200	700	10800	146300	157100
9-May-14	3267	6567	200	700	10733	155033	165767
10-May-14	3267	6567	200	700	10733	155033	165767
11-May-14	3267	6567	200	700	10733	155033	165767
12-May-14	3100	6500	200	200	10000	151000	161000
13-May-14	3300	6600	200	800	10900	151200	162100
14-May-14	3600	7300	300	700	11900	169900	181800
15-May-14	3000	6100	200	600	9900	170200	180100
16-May-14	2967	5433	200	667	9267	175500	184767
17-May-14	2967	5433	200	667	9267	175500	184767
18-May-14	2967	5433	200	667	9267	175500	184767
19-May-14	3200	4800	200	700	8900	147400	156300
20-May-14	3200	4800	200	800	9000	195900	204900
21-May-14	2400	3600	100	500	6600	123200	129800
22-May-14	3200	4800	200	700	8900	157900	166800
23-May-14	3125	5975	200	675	9975	152350	162325
24-May-14	3125	5975	200	675	9975	152350	162325
25-May-14	3125	5975	200	675	9975	152350	162325
26-May-14	3125	5975	200	675	9975	152350	162325
27-May-14	3100	6000	200	700	10000	175300	185300
28-May-14	3000	7300	200	600	11100	158300	169400
29-May-14	3100	8000	200	700	12000	149700	161700
30-May-14	3033	6633	200	667	10533	135667	146200
31-May-14	3033	6633	200	667	10533	135667	146200
1-Jun-14	3033	6633	200	667	10533	135667	146200
2-Jun-14	3000	6300	200	700	10200	160200	170400
3-Jun-14	3000	6500	200	600	10300	163200	173500
4-Jun-14	3200	6900	200	700	11000	141700	152700
5-Jun-14	2900	6900	200	600	10600	142100	152700
6-Jun-14	2967	6200	200	667	10033	142833	152867
7-Jun-14	2967	6200	200	667	10033	142833	152867
8-Jun-14	2967	6200	200	667	10033	142833	152867
9-Jun-14	2900	6500	200	600	10200	144800	155000
10-Jun-14	2900	6500	200	600	10200	127300	137500
11-Jun-14	3000	6300	200	700	10200	128600	138800
12-Jun-14	2700	5300	100	600	8700	122200	130900
13-Jun-14	2967	5767	200	600	9533	140467	150000
14-Jun-14	2967	5767	200	600	9533	140467	150000
15-Jun-14	2967	5767	200	600	9533	140467	150000
16-Jun-14	2900	5400	200	700	9200	129600	138800
17-Jun-14	2000	3700	100	400	6200	114500	120700
18-Jun-14	2900	5600	100	600	9200	158500	167700
19-Jun-14	3000	5400	200	600	9200	155000	164200
20-Jun-14	2967	5067	200	633	8867	156233	165100
21-Jun-14	2967	5067	200	633	8867	156233	165100
22-Jun-14	2967	5067	200	633	8867	156233	165100
23-Jun-14	2900	4900	200	600	8600	144800	153400

TABLE 2-1
SUMMARY OF PUMPING DATA
GEMS Landfill Phase II Project

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Date:	Groundwater Extraction Wells				Total Wells Only	Holly Run Underdrain (gallons)	Total Volume Collected (gallons)
	EX-1 (gallons)	EX-2 (gallons)	EX-3 (gallons)	EX-4 (gallons)			
24-Jun-14	2800	4700	200	600	8300	173900	182200
25-Jun-14	2900	4600	100	600	8200	168600	176800
26-Jun-14	2800	4600	200	600	8200	149300	157500
27-Jun-14	2800	4233	200	300	7533	151267	158800
28-Jun-14	2800	4233	200	300	7533	151267	158800
29-Jun-14	2800	4233	200	300	7533	151267	158800
30-Jun-14	2800	4000	200	0	7000	154800	161800
1-Jul-14	2700	4000	200	0	6900	173000	179900
2-Jul-14	2900	4200	200	0	7300	203500	210800
3-Jul-14	2725	3775	625	0	7125	161225	168350
4-Jul-14	2725	3775	625	0	7125	161225	168350
5-Jul-14	2725	3775	625	0	7125	161225	168350
6-Jul-14	2725	3775	625	0	7125	161225	168350
7-Jul-14	3100	3700	300	0	7100	188200	195300
8-Jul-14	2600	2800	200	0	5600	171000	176600
9-Jul-14	2800	4900	200	0	7900	173000	180900
10-Jul-14	2500	6100	200	0	8800	161900	170700
Total Gallons	1294800	1511100	79600	187500	3073000	51907280	54980280
Average (GPD)	3547	4140	218	514	8419	142212	150631
Average (gpm)	2.5	2.9	0.2	0.4	5.8	99	105

Table 3-1
SUMMARY OF MANUAL GROUNDWATER LEVEL DATA
GEMS Landfill Phase II Project

Well	Zone	Reference Elevation (ft., msl)	20-Jun-13		10-Sep-13		20-Jan-14		10-Apr-14	
			DTW (ft.)	Elev. (ft., msl)						
EX-1	L	122.79	44.74	78.05	47.71	75.08	41.76	81.03	46.86	75.93
EX-2	L	127.39	39.51	87.88	45.32	82.07	48.75	78.64	39.10	88.29
EX-3	L	127.63	39.25	88.38	37.24	90.39	40.81	86.82	41.20	86.43
EX-4	L	127.99	39.15	88.84	38.78	89.21	42.68	85.31	39.10	88.89
EX-5	L	131.07	30.99	100.08	30.84	100.23	31.50	99.57	29.66	101.41
EX-6	L	132.76	32.76	100.00	32.53	100.23	33.31	99.45	31.42	101.34
EX-7	L	127.41	27.48	99.93	27.13	100.28	28.06	99.35	29.21	98.20
EX-8	L	128.38	29.68	98.70	28.32	100.06	29.22	99.16	27.35	101.03
GW-04RR	U	128.32	20.71	107.61	20.49	107.83	20.90	107.42	19.51	108.81
MW-1007DR	L	128.17	20.59	107.58	20.36	107.81	20.78	107.39	19.40	108.77
MW-1008D	L	128.88	26.52	102.36	26.25	102.63	27.12	101.76	25.45	103.43
MW-1008S	U	128.45	26.04	102.41	25.71	102.74	26.70	101.75	25.00	103.45
MW-102AR	L	108.98	8.13	100.85	8.17	100.81	8.11	100.87	7.22	101.76
MW-907A	U	142.35	23.49	118.86	22.71	119.64	22.60	119.75	21.42	120.93
MW-907B	L	141.94	22.03	119.91	22.33	119.61	22.15	119.79	21.02	120.92
P-1	U	102.08	4.20	97.88	4.69	97.39	4.21	97.87	3.71	98.37
P-2	U	116.51	16.31	100.20	16.64	99.87	16.43	100.08	15.27	101.24
P-3	U	111.44	21.81	89.63	21.87	89.57	22.07	89.37	20.61	90.83
PM-01	U	135.30	28.11	107.19	27.77	107.53	28.56	106.74	27.16	108.14
PM-02	L	135.56	27.99	107.57	27.68	107.88	28.48	107.08	27.06	108.50
PM-03	U	131.78	25.69	106.09	25.45	106.33	26.01	105.77	24.51	107.27
PM-04	L	132.02	25.70	106.32	25.49	106.53	26.03	105.99	24.47	107.55
PM-05	L	124.36	25.26	99.10	25.01	99.35	25.75	98.61	23.98	100.38
PM-06	U	131.17	29.90	101.27	29.72	101.45	30.40	100.77	28.57	102.60
PM-07	L	131.81	30.51	101.30	30.34	101.47	31.02	100.79	29.21	102.60
PM-08	K	131.14	29.68	101.46	29.54	101.60	30.18	100.96	28.35	102.79
PM-09	U	129.88	30.23	99.65	30.21	99.67	30.71	99.17	28.60	101.28
PM-10	L	130.49	30.71	99.78	30.68	99.81	31.20	99.29	29.10	101.39
PM-11	L	103.98	6.39	97.59	6.75	97.23	6.68	97.30	5.16	98.82
PM-12	U	106.67	7.44	99.23	7.57	99.10	7.76	98.91	6.21	100.46
PM-13	L	105.45	6.34	99.11	6.39	99.06	6.49	98.96	5.19	100.26
PM-14	K	106.54	7.11	99.43	7.11	99.43	7.26	99.28	5.88	100.66
PM-15	U	105.87	7.09	98.78	7.44	98.43	7.31	98.56	6.10	99.77
PM-16	L	106.50	8.03	98.47	8.14	98.36	8.14	98.36	6.85	99.65
PM-17	K	106.22	7.36	98.86	7.49	98.73	7.48	98.74	6.20	100.02
PM-18	U	110.95	13.62	97.33	13.14	97.81	13.61	97.34	12.14	98.81
PM-19	U	108.91	7.70	101.21	7.73	101.18	7.72	101.19	6.95	101.96
PM-20	K	109.06	7.91	101.15	7.96	101.10	7.91	101.15	7.12	101.94
PM-21	U	108.53	7.38	101.15	7.50	101.03	7.51	101.02	6.19	102.34
PM-22	L	108.91	7.67	101.24	7.65	101.26	7.76	101.15	6.45	102.46
PM-23	K	108.73	8.01	100.72	7.80	100.93	8.02	100.71	6.67	102.06
PM-24	U	112.57	8.81	103.76	8.87	103.70	8.77	103.80	7.77	104.80
PM-25	U	120.50	9.39	111.11	11.75	108.75	11.12	109.38	10.32	110.18
PM-26	L	120.21	11.81	108.40	11.83	108.38	11.90	108.31	11.29	108.92
PM-27	K	119.12	10.65	108.47	10.68	108.44	10.73	108.39	10.10	109.02
PM-28	K	128.04	19.52	108.52	20.29	107.75	20.51	107.53	19.35	108.69
PM-29	U	137.23	21.91	115.32	21.83	115.40	22.03	115.20	20.87	116.36
PM-30	L	138.14	22.75	115.39	22.65	115.49	22.89	115.25	21.68	116.46

TABLE 4-1a
Summary of Groundwater Quality Data
Volatile Organic Compounds
(ug/L)

Parameter	NJ Higher of PQLs and GW Quality Criteria	PM-1		PM-2		PM-3		PM-4		PM-5		PM-11		PM-12		PM-13		
		Oct-13	May-14	Oct-13	May-14	Oct-13	May-14	Oct-13	May-14	Oct-13	May-14	Oct-13	May-14	Oct-13	May-14	Oct-13	May-14	
1,1,1-Trichloroethane	30	0.060 U	0.060 U	0.12 U	0.060 U	0.30 U	0.30 U											
1,1,2,2-Tetrachloroethane	1	0.16 U	0.16 U	0.32 U	0.16 U	0.16 U	0.16 U	0.16 U	0.16 U	0.16 U	0.16 U	0.16 U	0.16 U	0.16 U	0.16 U	0.80 U	0.80 U	
1,1,2-Trichloroethane	3	0.19 U	0.19 U	0.38 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.95 U	0.95 U	
1,1-Dichloroethane	50	0.13 U	0.13 U	0.26 U	0.13 U	0.13 U	0.13 U	0.13 U	0.13 U	0.13 U	0.13 U	0.13 U	0.13 U	0.13 U	0.13 U	0.65 U	0.65 U	
1,1-Dichloroethene	1	0.090 U	0.090 U	0.18 U	0.090 U	0.45 U	0.45 U											
1,2-Dichloroethane	2	0.19 U	0.19 U	0.38 U	0.19 U	0.19 U	0.19 U	0.35 J	0.19 U	0.95 U	0.95 U							
1,2-Dichloropropane	1	0.090 U	0.090 U	0.18 U	0.090 U	0.45 U	0.45 U											
2-Butanone	300	2.3U *	2.3 U	4.6U *	2.3 U	2.3U *	2.3 U	2.3U *	2.3 U	2.3U *	2.3 U	2.3U *	2.3 U	2.3U *	2.3 U	12 U	12 U	
2-Chloroethyl vinyl ether	NA	0.34 U	0.34 U	0.68 U	0.34 U	0.34 U	0.34 U	0.34 U	0.34 U	0.34 U	0.34 U	0.34 U	0.34 U	0.34 U	0.34 U	1.7 U	1.7 U	
2-Hexanone	NA	0.50 U	0.50 U	1.0 U	0.50 U	2.5 U	2.5 U											
4-Methyl-2-pentanone	NA	0.99 U	0.99 U	2.0 U	0.99 U	5.0 U	5.0 U											
Acetone	6000	2.7 U	2.7 U	5.4 U	2.7 U	2.7 U	2.7 U	2.7 U	2.7 U	2.7 U	2.7 U	2.7 U	2.7 U	2.7 U	2.7 U	13 U	13 U	
Benzene	1	0.080 U	0.080 U	0.16 U	0.14 J	0.080 U	0.080 U	0.91 J	0.75 J	0.080 U	0.080 U	0.080 U	0.080 U	0.39 J	0.080 U	27	25	
Bromodichloromethane	1	0.12 U	0.12 U	0.24 U	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U	0.60 U	0.60 U	
Bromoform	4	0.19 U	0.19 U	0.38 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.95 U	0.95 U	
Bromomethane	10	0.18 U	0.18 U	0.36 U	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U	0.90 U	0.90 U	
Carbon disulfide	700	0.13 U	0.13 U	0.26 U	0.13 U	0.13 U	0.13 U	0.13 U	0.13 U	0.13 U	0.13 U	0.13 U	0.13 U	0.13 U	0.13 U	0.65 U	0.65 U	
Carbon tetrachloride	1	0.060 U	0.060 U	0.12 U	0.060 U	0.30 U	0.30 U											
Chlorobenzene	50	0.11 U	0.11 U	0.22 U	0.25 J	0.11 U	8.0	0.44 J	640	790								
Chloroethane	5	0.17 U	0.17 U	0.34 U	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	0.85 U	0.85 U	
Chloroform	70	0.080 U	0.080 U	0.16 U	0.080 U	0.40 U	0.40 U											
Chloromethane	NA	0.10 U	0.10 U	0.20 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.50 U	0.50 U	
cis-1,3-Dichloropropene	1	0.18 U	0.18 U	0.36 U	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U	0.90 U	0.90 U	
Dibromochloromethane	1	0.20 U	0.20 U	0.40 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	1.0 U	1.0 U	
Ethylbenzene	700	0.10 U	0.10 U	0.39 J	0.16 J	0.10 U	0.10 U	0.17 J	0.31 J	0.10 U	120	120						
Methylene Chloride	3	0.18 U	0.18 U	0.36 U	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U	0.90 U	0.90 U	
Styrene	100	0.12 U	0.12 U	0.24 U	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U	0.60 U	0.60 U	
Tetrachloroethene	1	0.10 U	0.10 U	0.20 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.50 U	0.50 U	
Toluene	600	0.15 U	0.15 J	0.30 U	0.22 J	0.15 U	0.15 U	0.46 J	0.42 J	0.21 J	0.15 U	40	23					
trans-1,2-Dichloroethene	100	0.13 U	0.13 U	0.26 U	0.13 U	0.13 U	0.13 U	0.13 U	0.13 U	0.13 U	0.13 U	0.13 U	0.13 U	0.13 U	0.13 U	0.65 U	0.65 U	
trans-1,3-Dichloropropene	NA	0.24 U	0.24 U	0.48 U	0.24 U	0.24 U	0.24 U	0.24 U	0.24 U	0.24 U	0.24 U	0.24 U	0.24 U	0.24 U	0.24 U	1.2 U	1.2 U	
Trichloroethene	1	0.090 U	0.090 U	0.18 U	0.090 U	0.090 U	0.090 U	0.21 J	0.090 U	0.45 U	0.45 U							
Vinyl acetate	7000	0.38 U	0.38 U	0.76 U	0.38 U	0.38 U	0.38 U	0.38 U	0.38 U	0.38 U	0.38 U	0.38 U	0.38 U	0.38 U	0.38 U	1.9 U	1.9 U	
Vinyl chloride	1	0.14 U	0.14 U	0.28 U	0.14 U	0.14 U	0.14 U	0.14 U	0.14 U	0.14 U	0.14 U	0.14 U	0.14 U	0.14 U	0.14 U	0.70 U	0.70 U	
Xylenes, Total	1000	0.36 U	0.36 U	0.72 U	0.36 U	0.36 U	0.36 U	0.36 U	0.36 U	0.36 U	0.36 U	0.36 U	0.36 U	0.36 U	0.44 J	0.36 U	270	320

Notes:

U - Not detected.

J - Approximate value (result is < RL but ≥ MDL).

TABLE 4-1a
Summary of Groundwater Quality Data
Volatile Organic Compounds
(ug/L)

Parameter	NJ Higher of PQLs and GW Quality Criteria	PM-15		PM-16		PM-19		PM-21		PM-24		PM-25		PM-26		PM-29	
		Oct-13	May-14	Oct-13	May-14	Oct-13	May-14	Oct-13	May-14	Oct-13	May-14	Oct-13	May-14	Oct-13	May-14	Oct-13	May-14
1,1,1-Trichloroethane	30	0.060 U	0.060 U	0.060 U	0.060 U	0.30 U	0.30 U	0.060 U									
1,1,2,2-Tetrachloroethane	1	0.16 U	0.16 U	0.16 U	0.16 U	0.80 U	0.80 U	0.16 U	0.16 U	0.16 U	0.16 U	0.16 U	0.16 U	0.16 U	0.16 U	0.16 U	0.16 U
1,1,2-Trichloroethane	3	0.19 U	0.19 U	0.19 U	0.19 U	0.95 U	0.95 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U
1,1-Dichloroethane	50	0.13 U	0.13 U	2.3	2.7	0.65 U	0.65 U	0.13 U	0.13 U	0.13 U	0.13 U	0.13 U	0.13 U	0.13 U	0.13 U	0.13 U	0.13 U
1,1-Dichloroethene	1	0.090 U	0.090 U	0.090 U	0.090 U	0.45 U	0.45 U	0.090 U									
1,2-Dichloroethane	2	0.19 U	0.19 U	0.19 U	1.6	0.95 U	0.95 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U
1,2-Dichloropropane	1	0.090 U	0.090 U	0.090 U	0.090 U	0.45 U	0.45 U	0.090 U									
2-Butanone	300	2.3 U	2.3 U	2.3 U	2.3 U	12 U	12 U	2.3U*	2.3 U	2.3 U	2.3 U	2.3U*	2.3 U				
2-Chloroethyl vinyl ether	NA	0.34 U	0.34 U	0.34 U	0.34 U	1.7 U	1.7 U	0.34 U									
2-Hexanone	NA	0.50 U	0.50 U	0.50 U	0.50 U	2.5 U	2.5 U	0.50 U									
4-Methyl-2-pentanone	NA	0.99 U	0.99 U	0.99 U	0.99 U	5.0 U	5.0 U	0.99 U									
Acetone	6000	2.7 U	2.7 U	2.7 U	2.7 U	13 U	13 U	2.7 U	13	2.7 U							
Benzene	1	0.080 U	0.080 U	89	100	63	71	0.080 U									
Bromodichloromethane	1	0.12 U	0.12 U	0.12 U	0.12 U	0.60 U	0.60 U	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U
Bromoform	4	0.19 U	0.19 U	0.19 U	0.19 U	0.95 U	0.95 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U
Bromomethane	10	0.18 U	0.18 U	0.18 U	0.18 U	0.90 U	0.90 U	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U
Carbon disulfide	700	0.13 U	0.13 U	0.13 U	0.13 U	0.65 U	0.65 U	0.13 U	0.13 U	0.13 U	0.13 U	0.13 U	0.13 U	0.13 U	0.13 U	0.13 U	0.13 U
Carbon tetrachloride	1	0.060 U	0.060 U	0.060 U	0.060 U	0.30 U	0.30 U	0.060 U									
Chlorobenzene	50	0.58 J	0.11 U	61	84	22	30	0.11 U									
Chloroethane	5	0.17 U	0.17 U	9.6	15	0.85 U	0.85 U	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U
Chloroform	70	0.080 U	0.080 U	0.080 U	0.080 U	0.40 U	0.40 U	0.080 U									
Chloromethane	NA	0.10 U	0.10 U	0.10 U	0.10 U	0.50 U	0.50 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
cis-1,3-Dichloropropene	1	0.18 U	0.18 U	0.18 U	0.18 U	0.90 U	0.90 U	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U
Dibromochloromethane	1	0.20 U	0.20 U	0.20 U	0.20 U	1.0 U	1.0 U	0.20 U									
Ethylbenzene	700	0.10 U	0.10 U	20	32	70	47	0.10 U									
Methylene Chloride	3	0.18 U	0.18 U	0.18 U	0.18 U	0.90 U	0.90 U	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U
Styrene	100	0.12 U	0.12 U	0.12 U	0.12 U	0.60 U	0.60 U	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U
Tetrachloroethene	1	0.10 U	0.10 U	0.10 U	0.10 U	0.50 U	0.50 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
Toluene	600	0.20 J	1.3	3.5	4.8	2.4 J	2.2 J	0.42 J	0.15 U	0.15 U	0.15 U	0.39 J	0.15 U				
trans-1,2-Dichloroethene	100	0.13 U	0.13 U	0.13 U	0.33 J	0.65 U	0.97 J	0.13 U									
trans-1,3-Dichloropropene	NA	0.24 U	0.24 U	0.24 U	0.24 U	1.2 U	1.2 U	0.24 U									
Trichloroethene	1	0.090 U	0.090 U	0.090 U	0.090 U	0.45 U	0.45 U	0.090 U									
Vinyl acetate	7000	0.38 U	0.38 U	0.38 U	0.38 U	1.9 U	1.9 U	0.38 U									
Vinyl chloride	1	0.14 U	0.14 U	0.14 U	0.14 U	0.70 U	0.70 U	0.14 U	0.14 U	0.14 U	0.14 U	0.14 U	0.14 U	0.14 U	0.14 U	0.14 U	0.14 U
Xylenes, Total	1000	0.36 U	0.36 U	28	40	63	24	0.36 U									

Notes:

U - Not detected.

J - Approximate value (result is < RL but ≥ MDL).

TABLE 4-1a
Summary of Groundwater Quality Data
Volatile Organic Compounds
(ug/L)

Parameter	NJ Higher of PQLs and GW Quality Criteria	PM-30		MW-102AR		MW-907A		MW-907B		MW-1008D		MW-1008S	
		Oct-13	May-14	Oct-13	May-14	Oct-13	May-14	Oct-13	May-14	Oct-13	May-14	Oct-13	May-14
1,1,1-Trichloroethane	30	0.060 U	0.060 U	0.060 U	0.060 U	0.060 U	0.060 U	0.060 U	0.060 U	0.060 U	0.060 U	0.060 U	0.060 U
1,1,2,2-Tetrachloroethane	1	0.16 U	0.16 U	0.16 U	0.16 U	0.16 U	0.16 U	0.16 U	0.16 U	0.16 U	0.16 U	0.16 U	0.16 U
1,1,2-Trichloroethane	3	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U
1,1-Dichloroethane	50	0.20 J	0.13 U	1.1	0.13 U	0.13 U	0.13 U	0.13 U	0.13 U	0.13 U	0.13 U	0.13 U	0.13 U
1,1-Dichloroethene	1	0.090 U	0.090 U	0.090 U	0.090 U	0.090 U	0.090 U	0.090 U	0.090 U	0.090 U	0.090 U	0.090 U	0.090 U
1,2-Dichloroethane	2	0.19 U	0.19 U	5.3	0.79 J	0.19 U	0.19 U	0.19 U	0.19 U				
1,2-Dichloropropane	1	0.090 U	0.090 U	0.090 U	0.090 U	0.090 U	0.090 U	0.090 U	0.090 U	0.090 U	0.090 U	0.090 U	0.090 U
2-Butanone	300	2.3 U	2.3 U	2.3 U	2.3 U	2.3U*	2.3 U	2.3U*	2.3 U	2.3U*	2.3 U	2.3U*	2.3 U
2-Chloroethyl vinyl ether	NA	0.34 U	0.34 U	0.34 U	0.34 U	0.34 U	0.34 U	0.34 U	0.34 U	0.34 U	0.34 U	0.34 U	0.34 U
2-Hexanone	NA	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
4-Methyl-2-pentanone	NA	0.99 U	0.99 U	0.99 U	0.99 U	0.99 U	0.99 U	0.99 U	0.99 U	0.99 U	0.99 U	0.99 U	0.99 U
Acetone	6000	2.7 U	2.7 U	2.7 U	20	2.7 U	2.7 U	2.7 U	2.7 U				
Benzene	1	0.20 J	0.080 U	57	50	0.080 U	0.080 U	0.080 U	0.080 U				
Bromodichloromethane	1	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U
Bromoform	4	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U
Bromomethane	10	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U
Carbon disulfide	700	0.13 U	0.13 U	0.13 U	0.13 U	0.13 U	0.13 U	0.13 U	0.13 U	0.13 U	0.13 U	0.13 U	0.13 U
Carbon tetrachloride	1	0.060 U	0.060 U	0.060 U	0.060 U	0.060 U	0.060 U	0.060 U	0.060 U	0.060 U	0.060 U	0.060 U	0.060 U
Chlorobenzene	50	2.6	1.3	1.0	0.95 J	0.11 U	0.11 U	0.11 U	0.11 U	2.2	0.11 U	0.11 U	0.11 U
Chloroethane	5	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U
Chloroform	70	0.080 U	0.080 U	0.080 U	0.080 U	0.080 U	0.080 U	0.30 J	0.27 J	0.080 U	0.080 U	0.27 J	0.080 U
Chloromethane	NA	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
cis-1,3-Dichloropropene	1	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U
Dibromochloromethane	1	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Ethylbenzene	700	0.10 U	0.10 U	6.6	4.4	0.10 U	0.10 U	0.10 U	0.10 U				
Methylene Chloride	3	0.18 U	0.18 U	1.9	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U
Styrene	100	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U
Tetrachloroethene	1	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
Toluene	600	0.15 U	0.15 U	74	30	0.15 U	0.15 U	0.15 U	0.17 J	0.16 J	0.15 U	0.15 U	0.15 U
trans-1,2-Dichloroethene	100	0.13 U	0.13 U	0.13 U	0.13 U	0.13 U	0.13 U	0.13 U	0.13 U	0.13 U	0.13 U	0.13 U	0.13 U
trans-1,3-Dichloropropene	NA	0.24 U	0.24 U	0.24 U	0.24 U	0.24 U	0.24 U	0.24 U	0.24 U	0.24 U	0.24 U	0.24 U	0.24 U
Trichloroethene	1	0.090 U	0.090 U	1.4	0.14 J	0.090 U	0.090 U	0.090 U	0.090 U				
Vinyl acetate	7000	0.38 U	0.38 U	0.38 U	0.38 U	0.38 U	0.38 U	0.38 U	0.38 U	0.38 U	0.38 U	0.38 U	0.38 U
Vinyl chloride	1	0.14 U	0.14 U	0.14 U	0.14 U	0.14 U	0.14 U	0.14 U	0.14 U	0.14 U	0.14 U	0.14 U	0.14 U
Xylenes, Total	1000	0.36 U	0.36 U	21	12	0.36 U	0.36 U	0.36 U	0.36 U				

Notes:

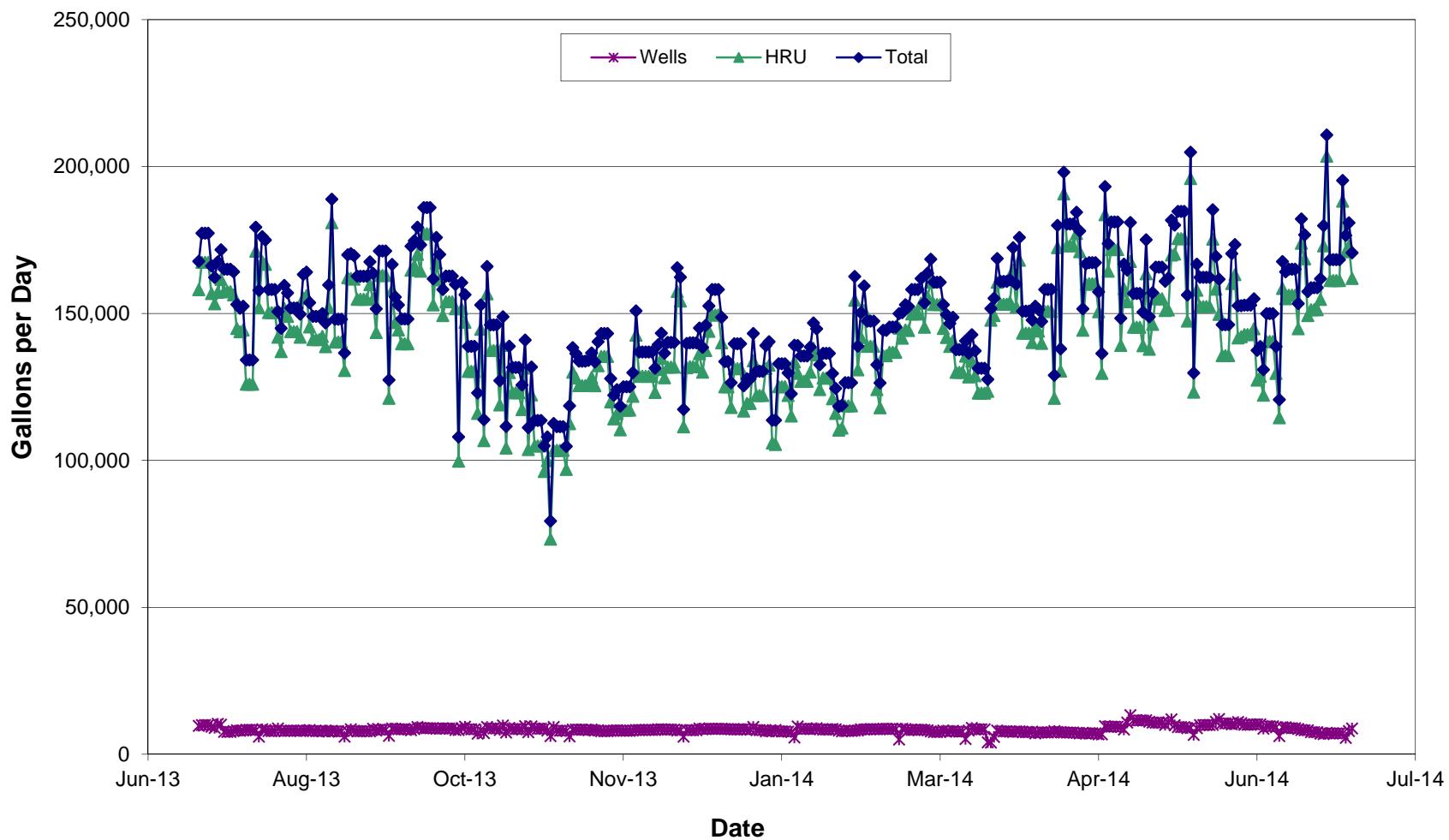
U - Not detected.

J - Approximate value (result is < RL but ≥ MDL).

Table 4-1b
 Summary of Groundwater Quality Data
 Metals
 (ug/l)

Parameter	Arsenic		Cadmium		Chromium	
NJ Higher of PQLs and GW Quality 2008 Criteria:	3 ppb		4 ppb		70 ppb	
Well ID	Oct-13	May-14	Oct-13	May-14	Oct-13	May-14
PM-1	1.8	U	2.1	U	1.9	U
PM-2	3.2		2.1	J	2.7	
PM-3	1.8	U	2.1	U	1.9	U
PM-4	2.3	J	2.1	U	1.9	U
PM-5	1.8	U	2.1	U	1.9	U
PM-11	1.8	U	2.1	U	1.9	U
PM-12	2.8		2.8		1.9	U
PM-13	9.0		6.3		1.9	U
PM-15	3.2		2.2	J	1.9	U
PM-16	7.9		7.7		1.9	U
PM-19	112		125		1.9	U
PM-21	1.8	U	3.3		1.9	U
PM-24	1.8	U	2.1	U	1.9	U
PM-25	2.1	J	6.0		1.9	U
PM-26	1.8	U	2.1	U	1.9	U
PM-29	1.8	U	2.1	U	1.9	J
PM-30	2.0	J	2.1	U	1.9	U
MW-102AR	48.1		56.5		1.9	U
MW-907A	5.2		3.5		1.9	U
MW-907B	1.8	U	2.1	U	5.2	
MW-1008S	1.8	U	2.1	U	1.9	U
MW-1008D	1.8	U	2.1	U	1.9	J

FIGURES



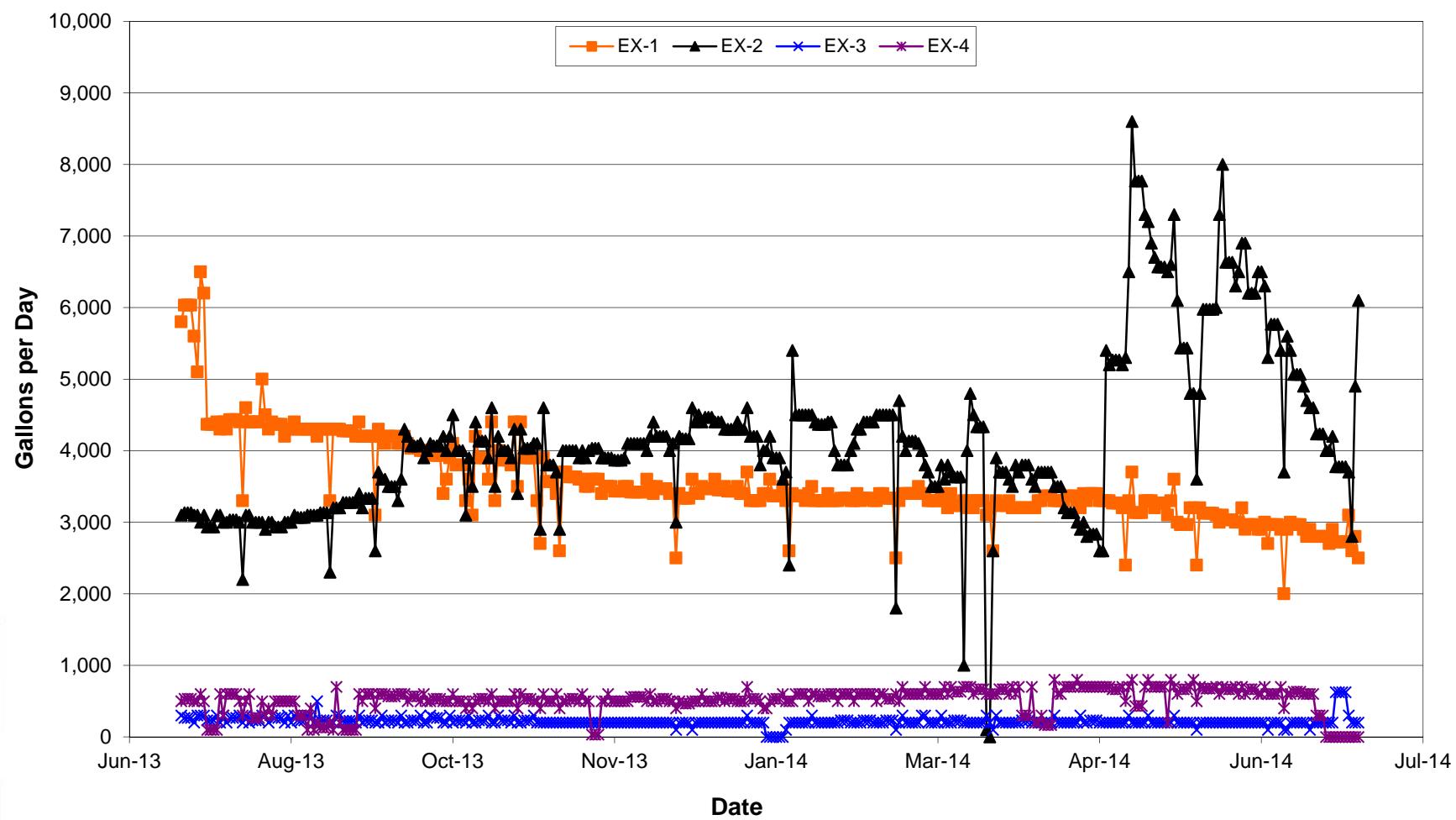
PREPARED BY:
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GEMS Landfill, Phase II
Gloucester Township, New Jersey
Summary of Groundwater Extraction Rates
Ninth Year of Operation
July 2013 through June 2014

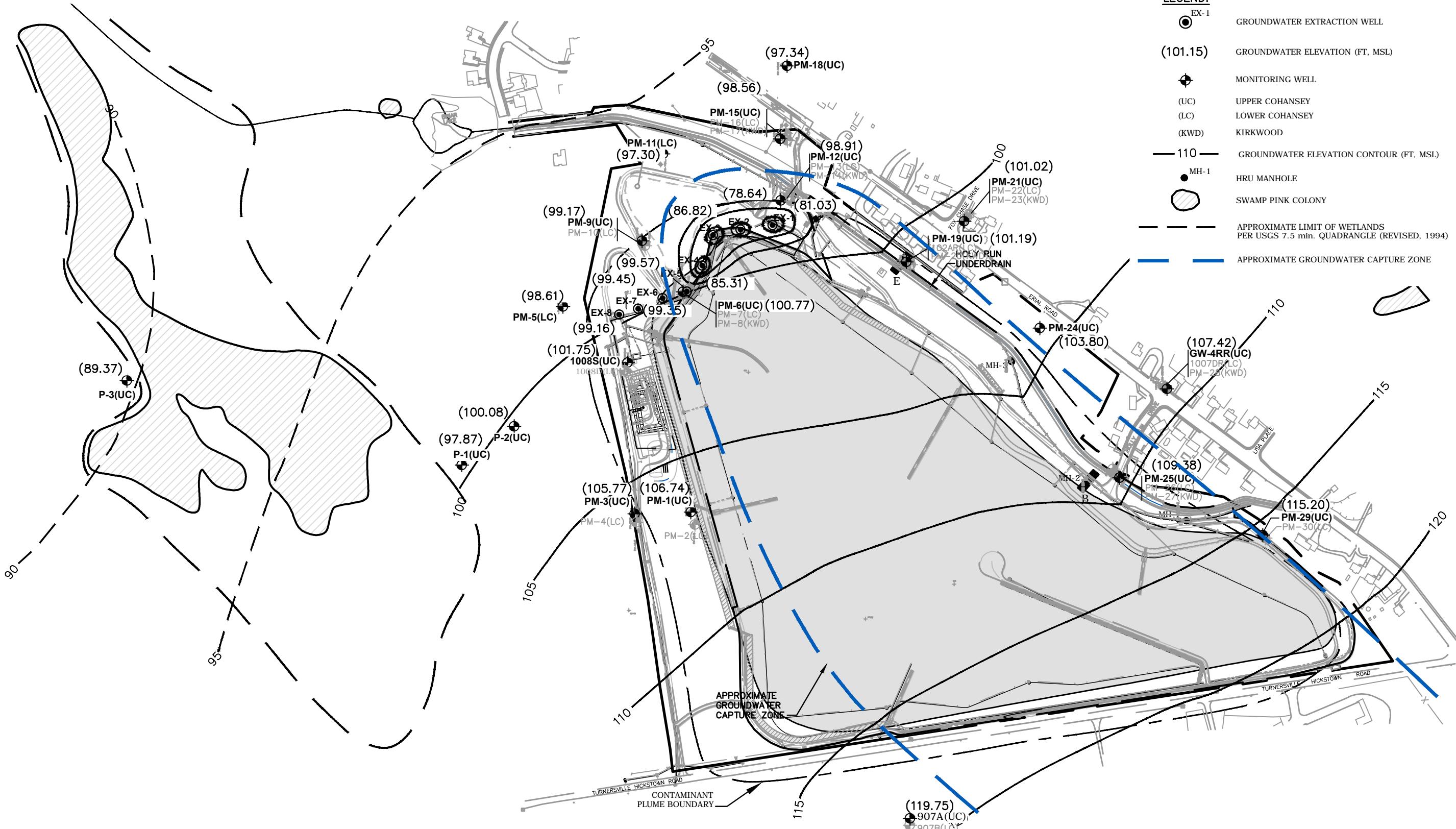
FIGURE NO.
2-1

PROJECT NO.
110349



GEMS Landfill, Phase II
Gloucester Township, New Jersey
Individual Extraction Well Pumping Rates
Ninth Year of Operation
July 2013 through June 2014

FIGURE NO.
2-2
PROJECT NO.
110349



0 400 800
SCALE IN FEET



PREPARED BY:
CORNERSTONE ENGINEERING GROUP, LLC

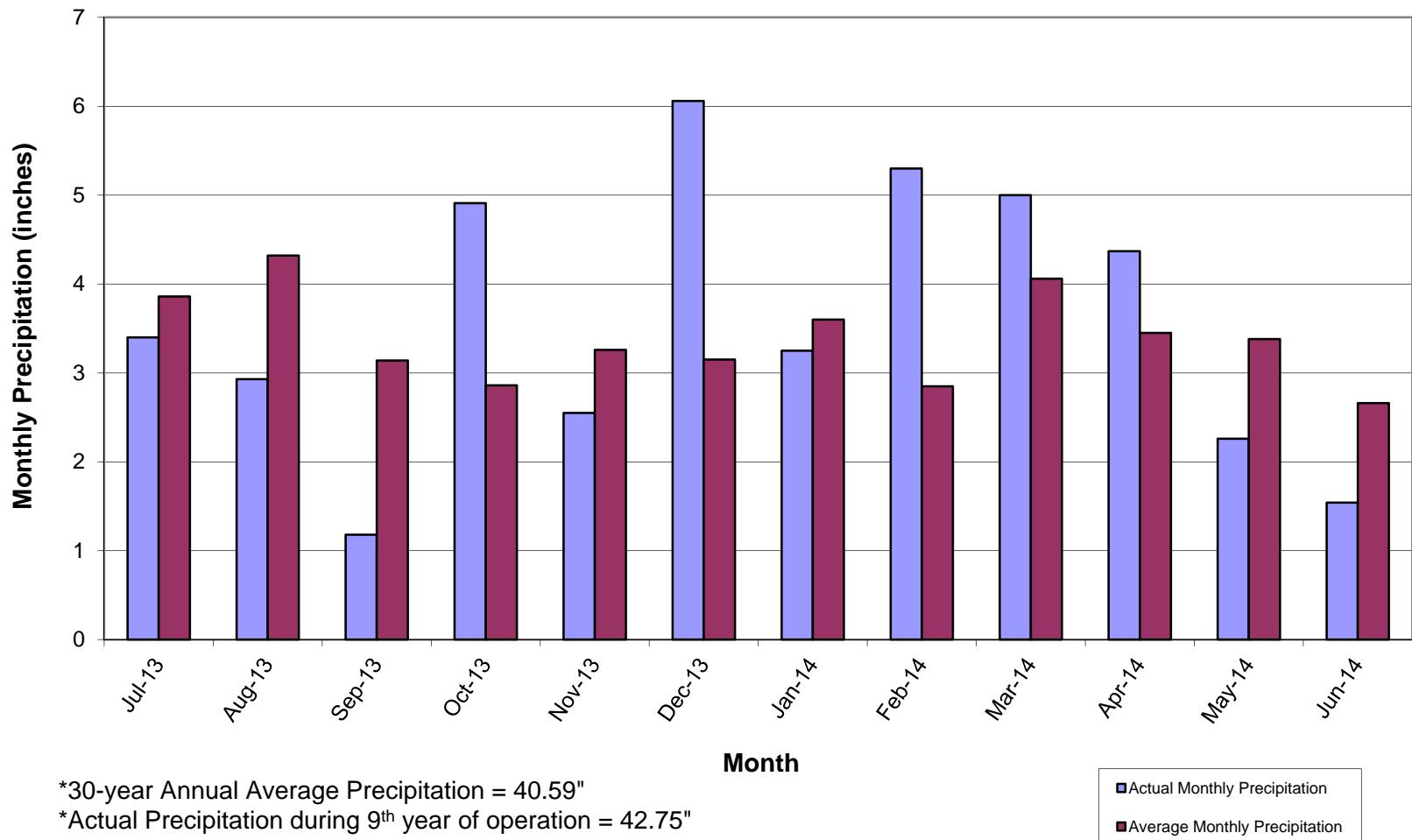
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GEMS LANDFILL
GLOUCESTER TOWNSHIP, NEW JERSEY

GROUNDWATER ELEVATION CONTOURS
9 YEARS AFTER STARTUP - JANUARY 20, 2014

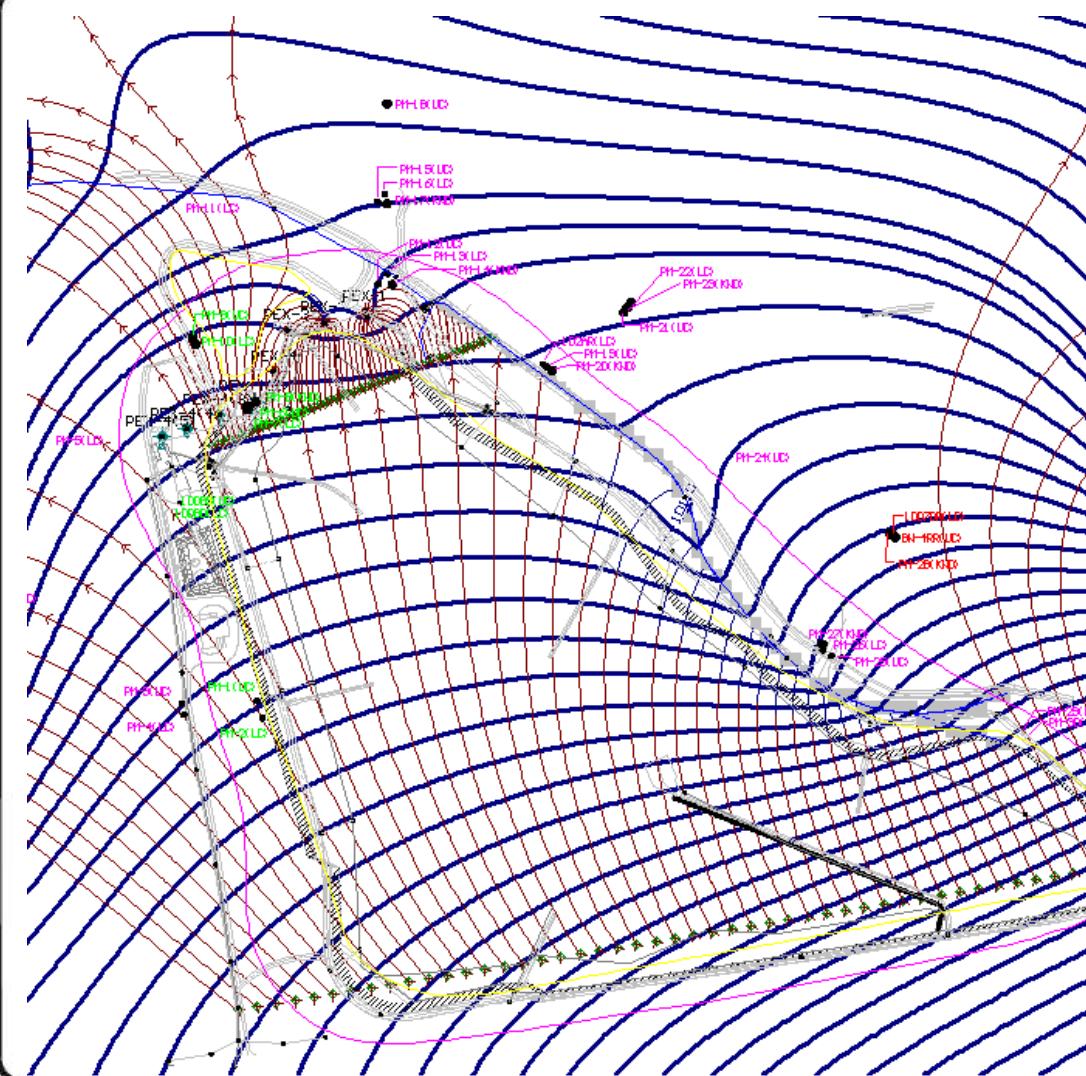
FIGURE NO.
3-1

PROJECT NO.
110349



GEMS Landfill, Phase II
 Gloucester Township, New Jersey
Monthly Precipitation Data
Atlantic City, New Jersey
July 2013 through June 2014

FIGURE NO.
3-2
 PROJECT NO.
 110349



LEGEND

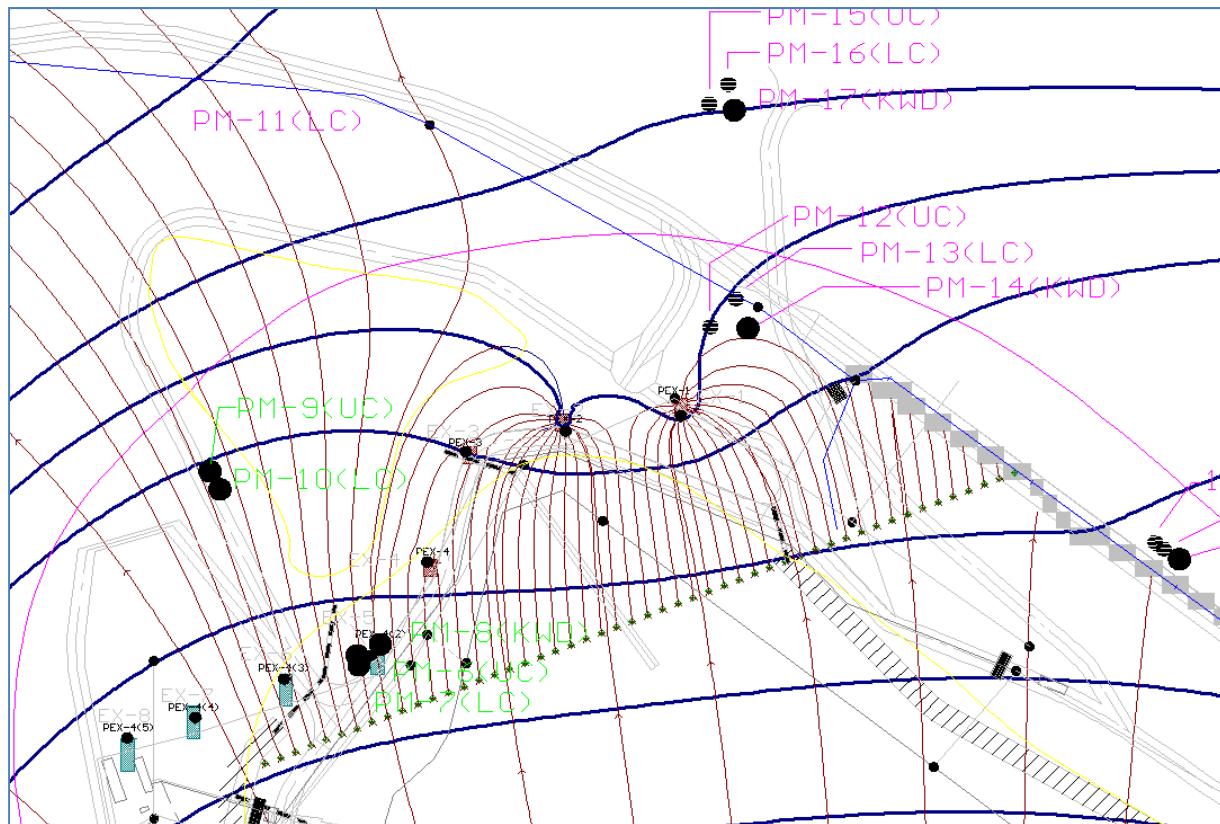
- Predicted GW Elevation Contour
- Predicted GW Pathline
- Estimated Capture Zone

NTS



GEMS Landfill, Phase II
Gloucester Township, New Jersey
Predicted Capture Zone
Average Groundwater Extraction Rates
July 2013 through June 2014

FIGURE NO.
3-3
PROJECT NO.
110349



LEGEND

Predicted GW
Elevation Contour

Predicted GW
Pathline

Estimated
Capture Zone

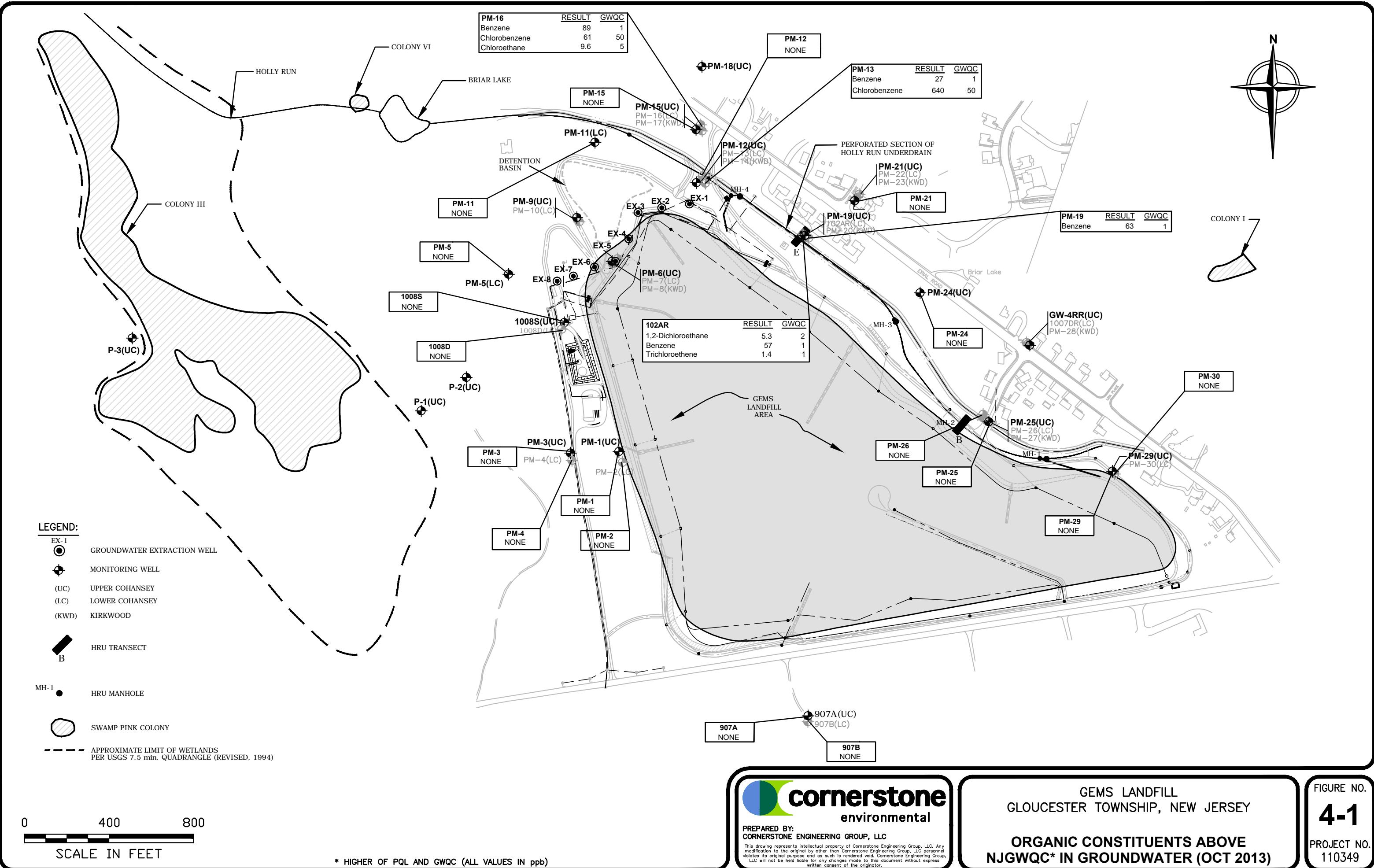
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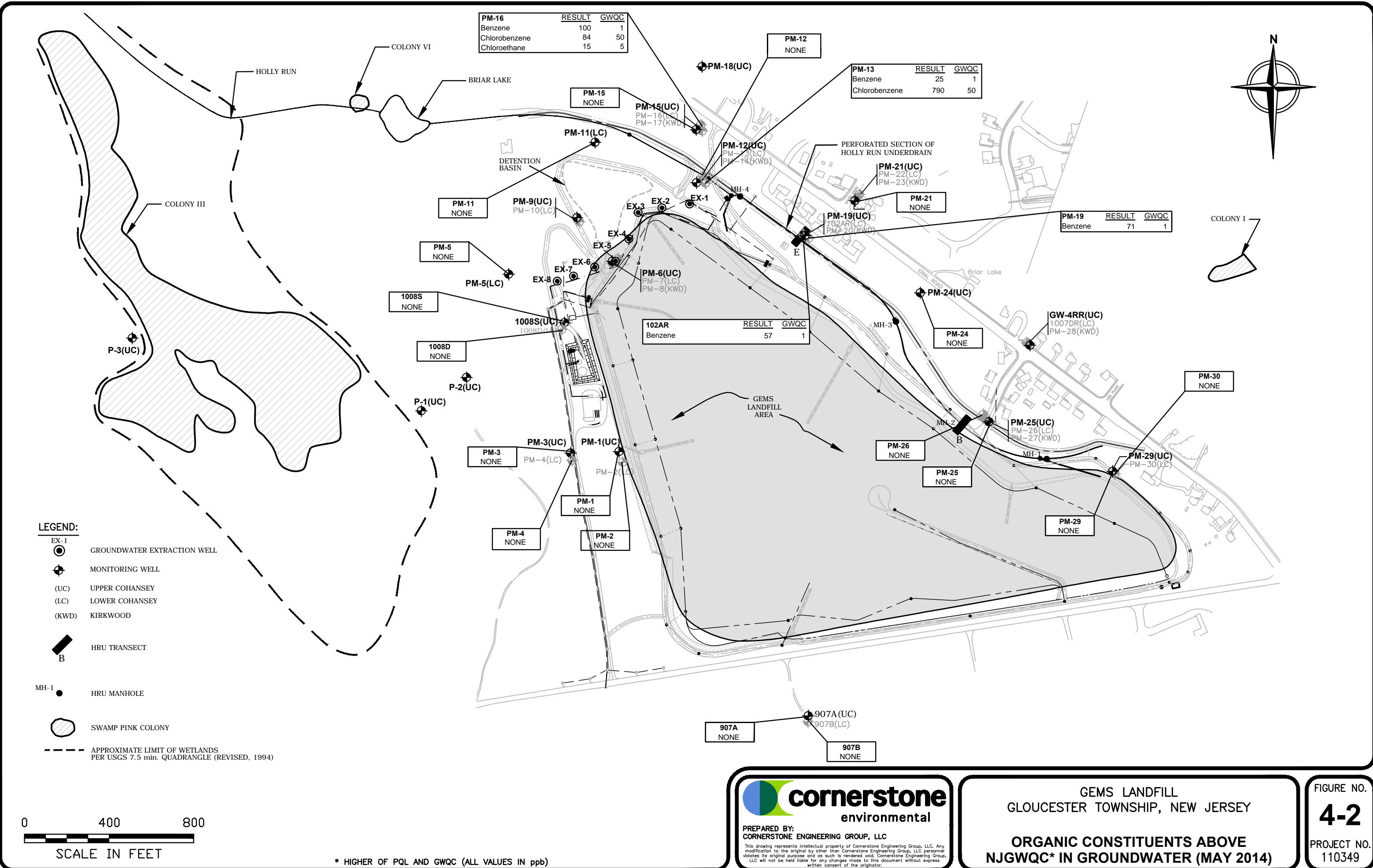


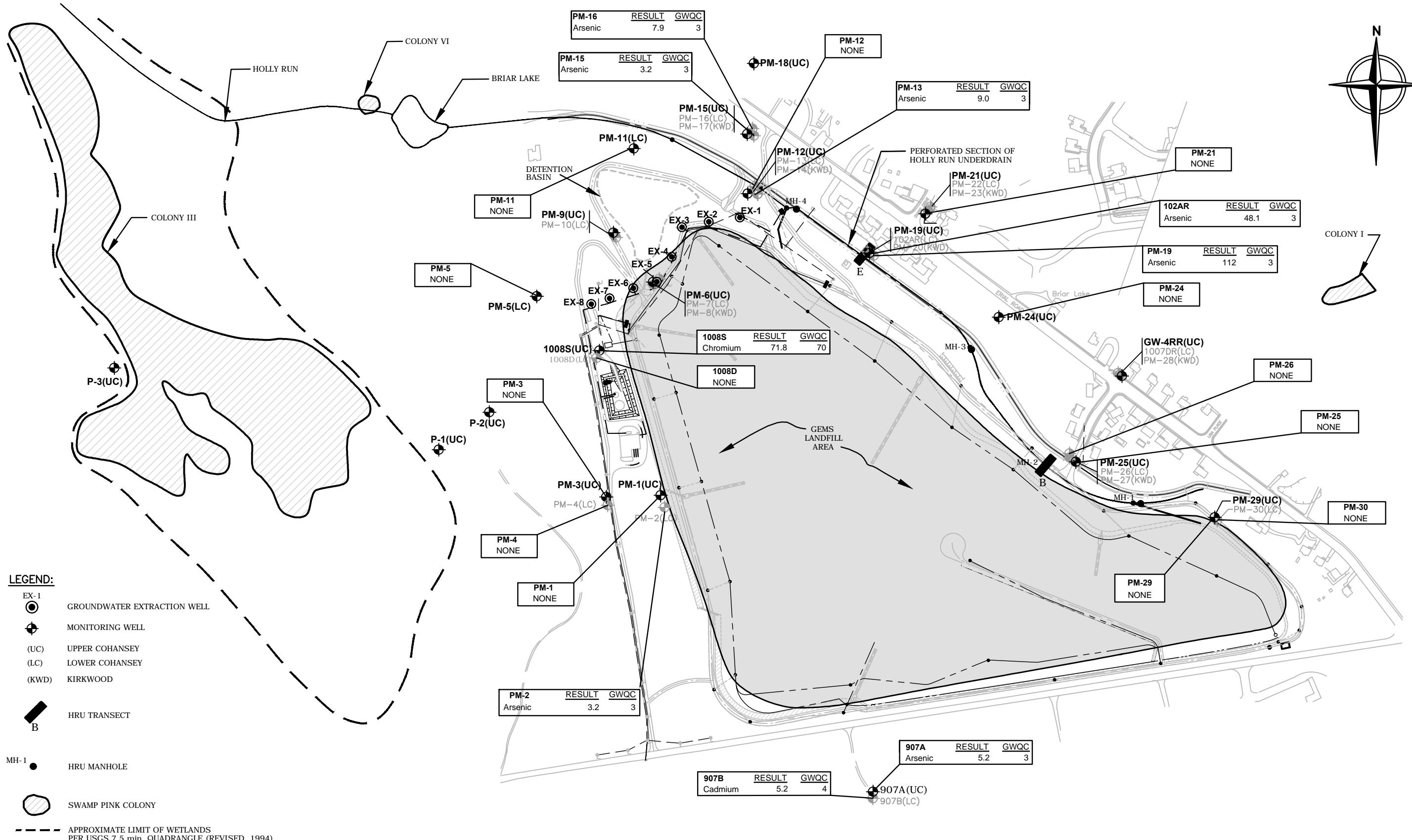
GEMS Landfill, Phase II
Gloucester Township, New Jersey

**Close-up of
Predicted Capture Zone**

FIGURE NO.
3-4
PROJECT NO.
110349







0 400 800
SCALE IN FEET

NOTE:

1. ONLY ARSENIC, CADMIUM AND CHROMIUM WERE ANALYZED.

* HIGHER OF PQL AND GWQC (ALL VALUES IN ppb)



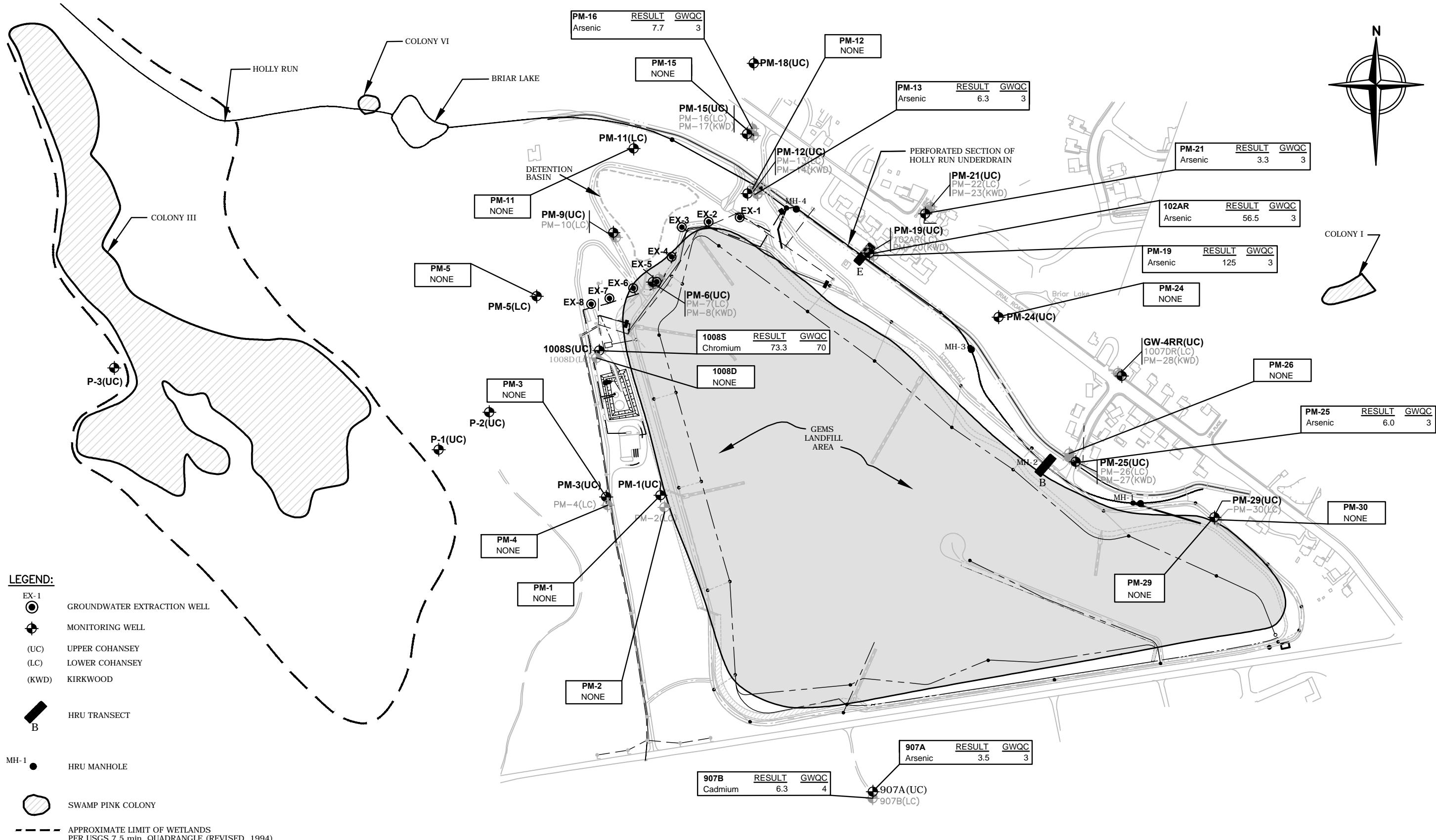
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GEMS LANDFILL
GLOUCESTER TOWNSHIP, NEW JERSEY
**INORGANIC CONSTITUENTS ABOVE
NJGWQC* IN GROUNDWATER (OCT 2013)**

FIGURE NO.
4-3

PROJECT NO.
110349



0 400 800
SCALE IN FEET

NOTE:

1. ONLY ARSENIC, CADMIUM AND CHROMIUM WERE ANALYZED.

* HIGHER OF PQL AND GWQC (ALL VALUES IN ppb)



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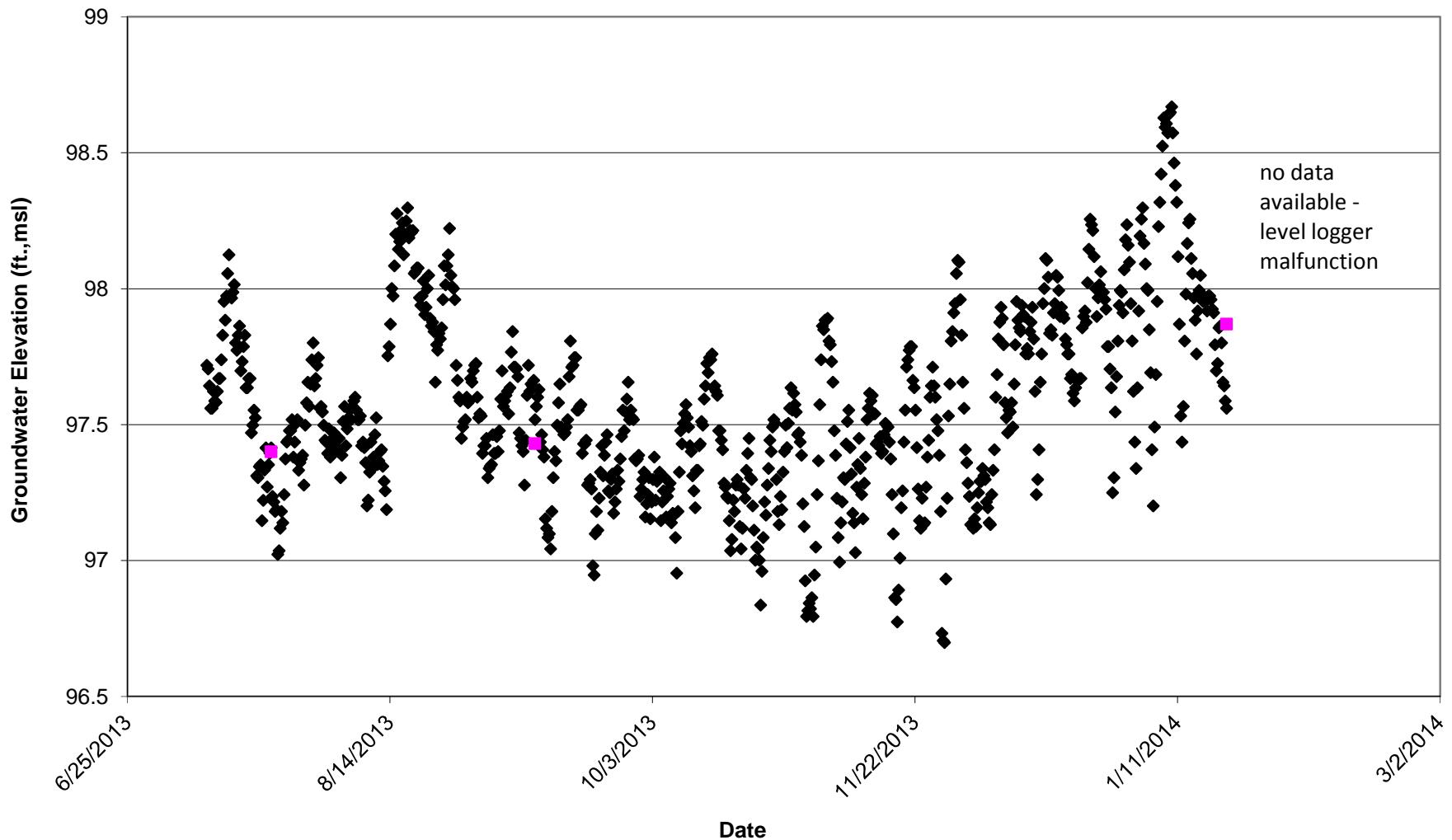
GEMS LANDFILL
GLOUCESTER TOWNSHIP, NEW JERSEY
**INORGANIC CONSTITUENTS ABOVE
NJGWQC* IN GROUNDWATER (MAY 2014)**

FIGURE NO.
4-4
PROJECT NO.
110349

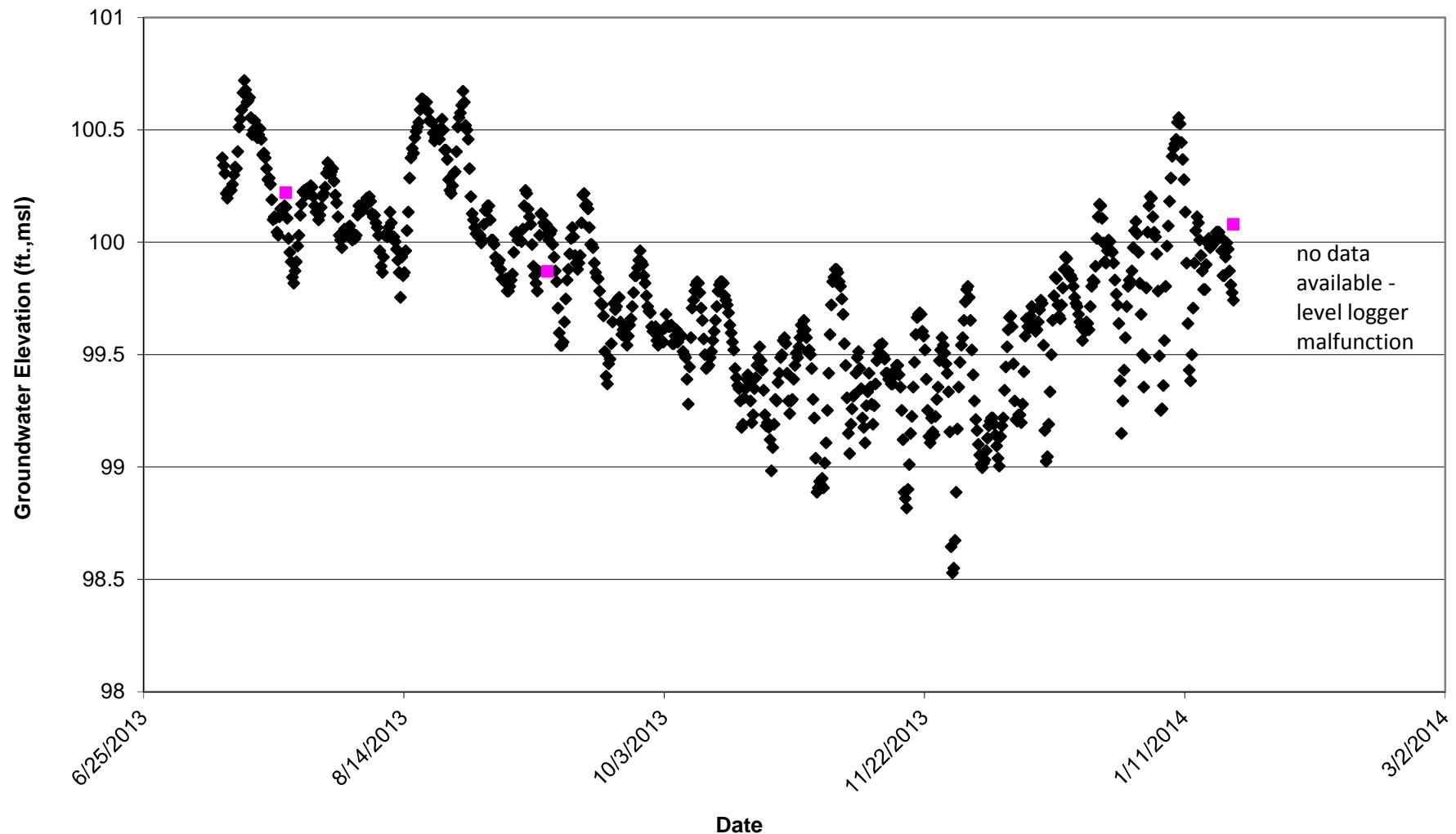
APPENDIX A

MONITORING WELL HYDROGRAPHS

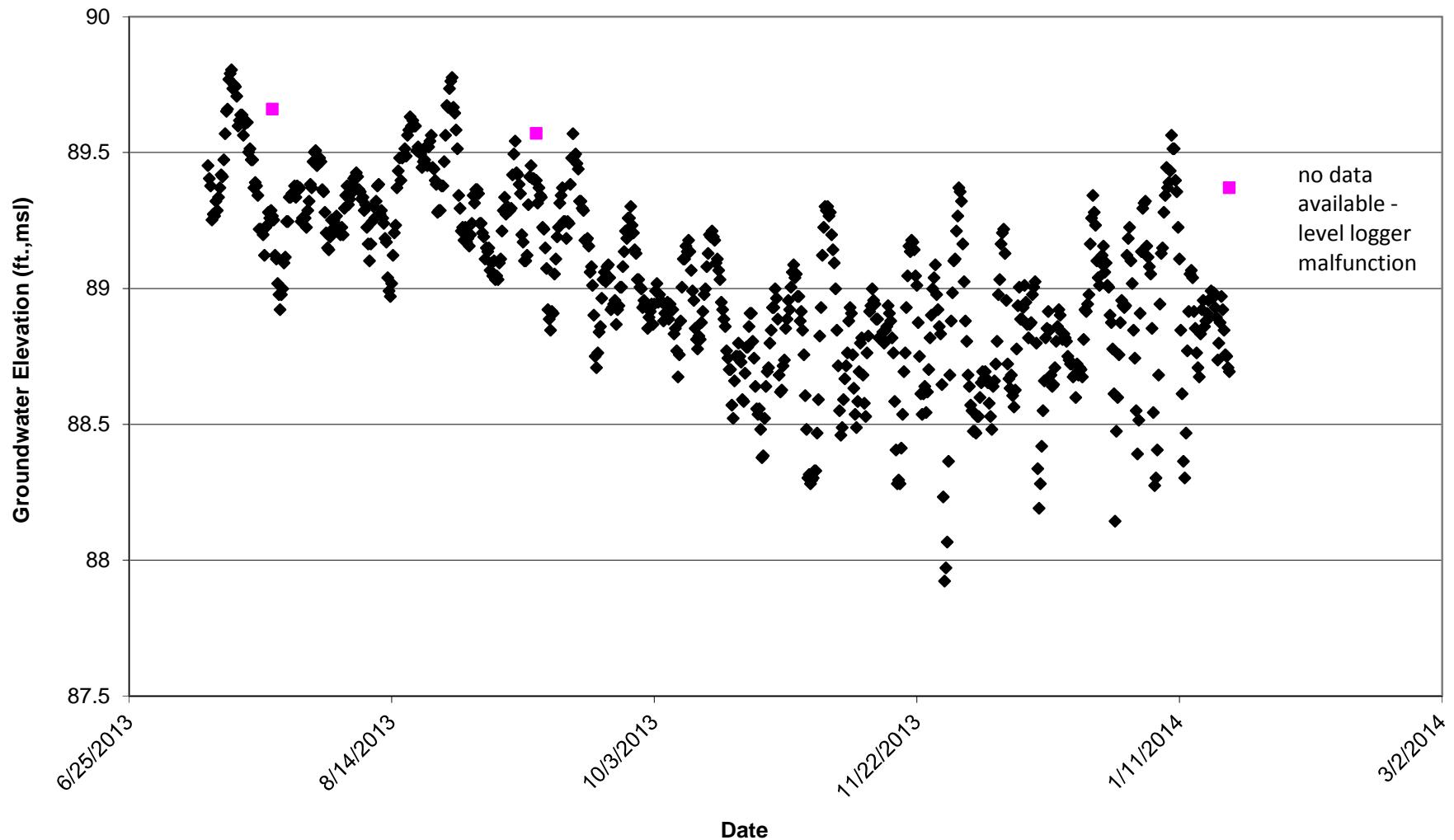
HYDROGRAPH OF P-1
GEMS Landfill Phase II Project
9th Annual Report



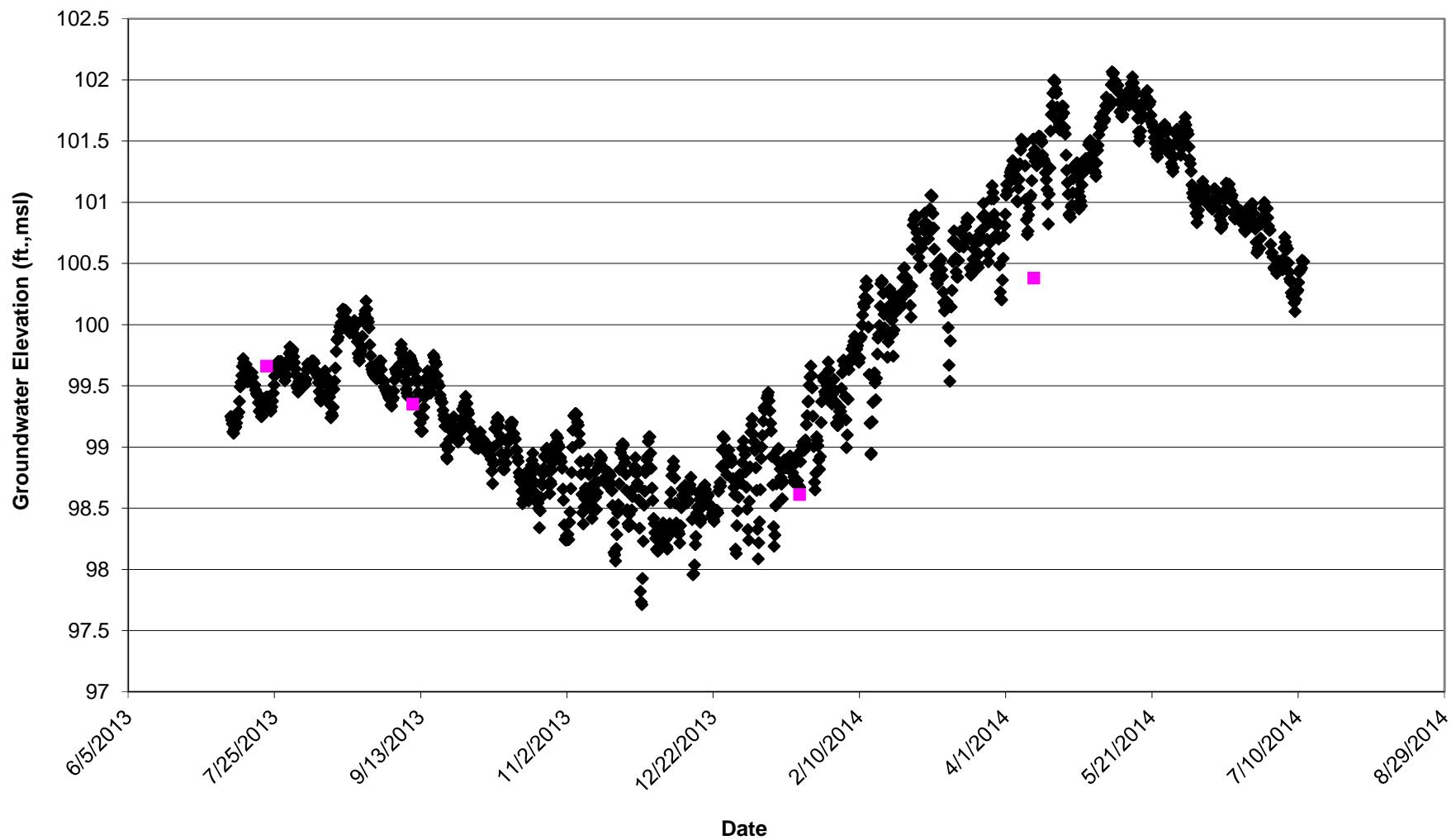
HYDROGRAPH OF P-2
GEMS Landfill Phase II Project
9th Annual Report



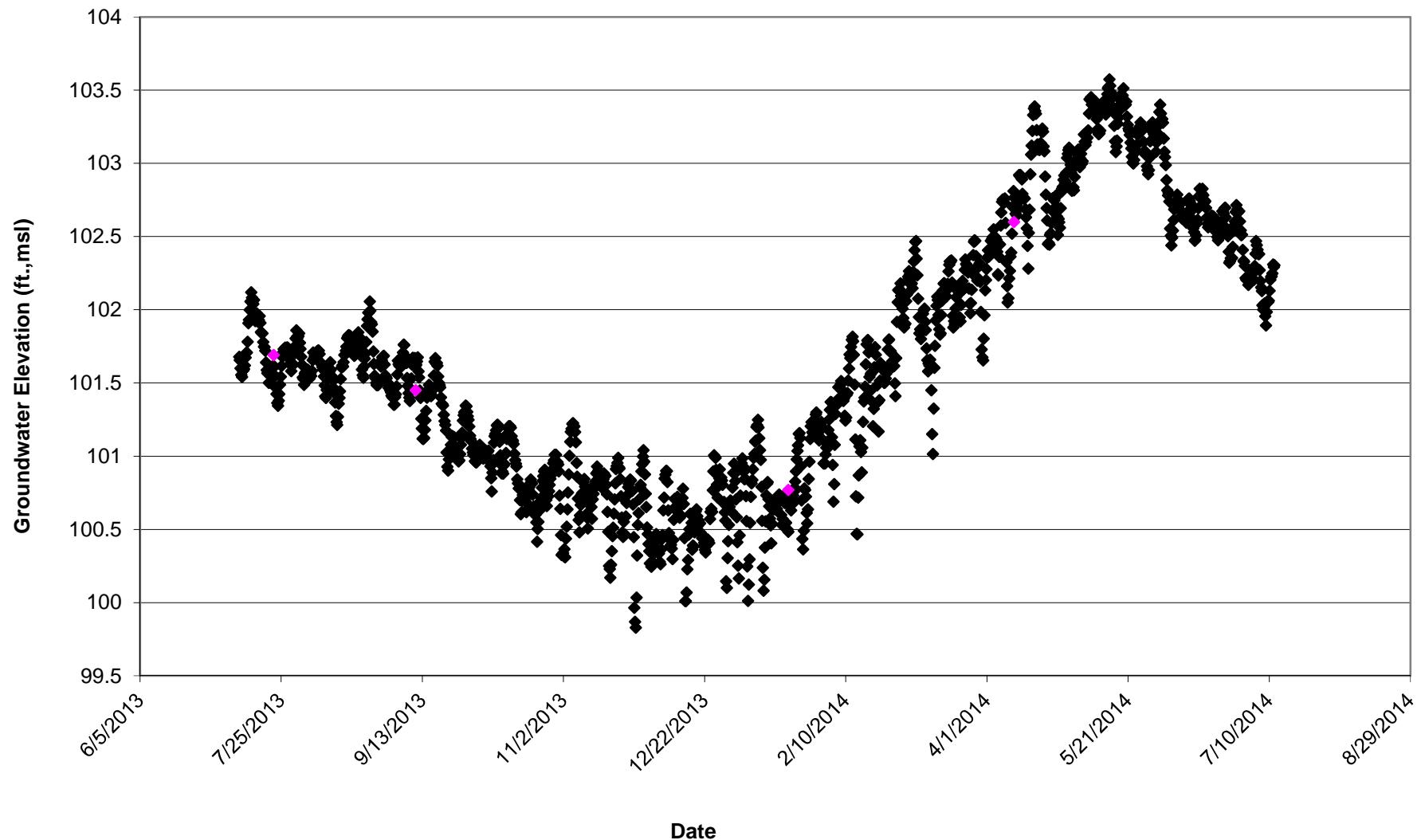
HYDROGRAPH OF P-3
GEMS Landfill Phase II Project
9th Annual Report



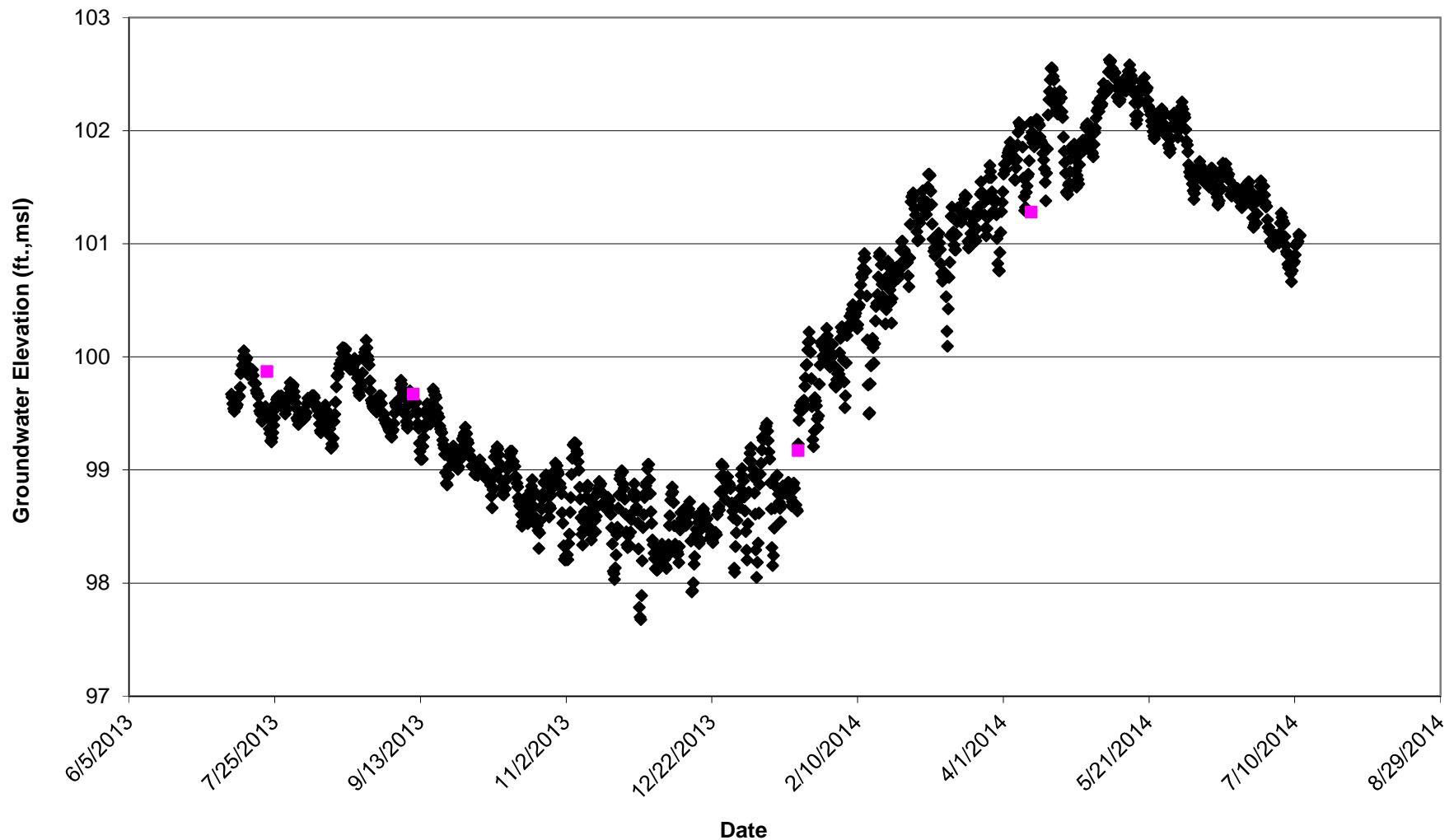
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GEMS Landfill Phase II Project
9th Annual Report



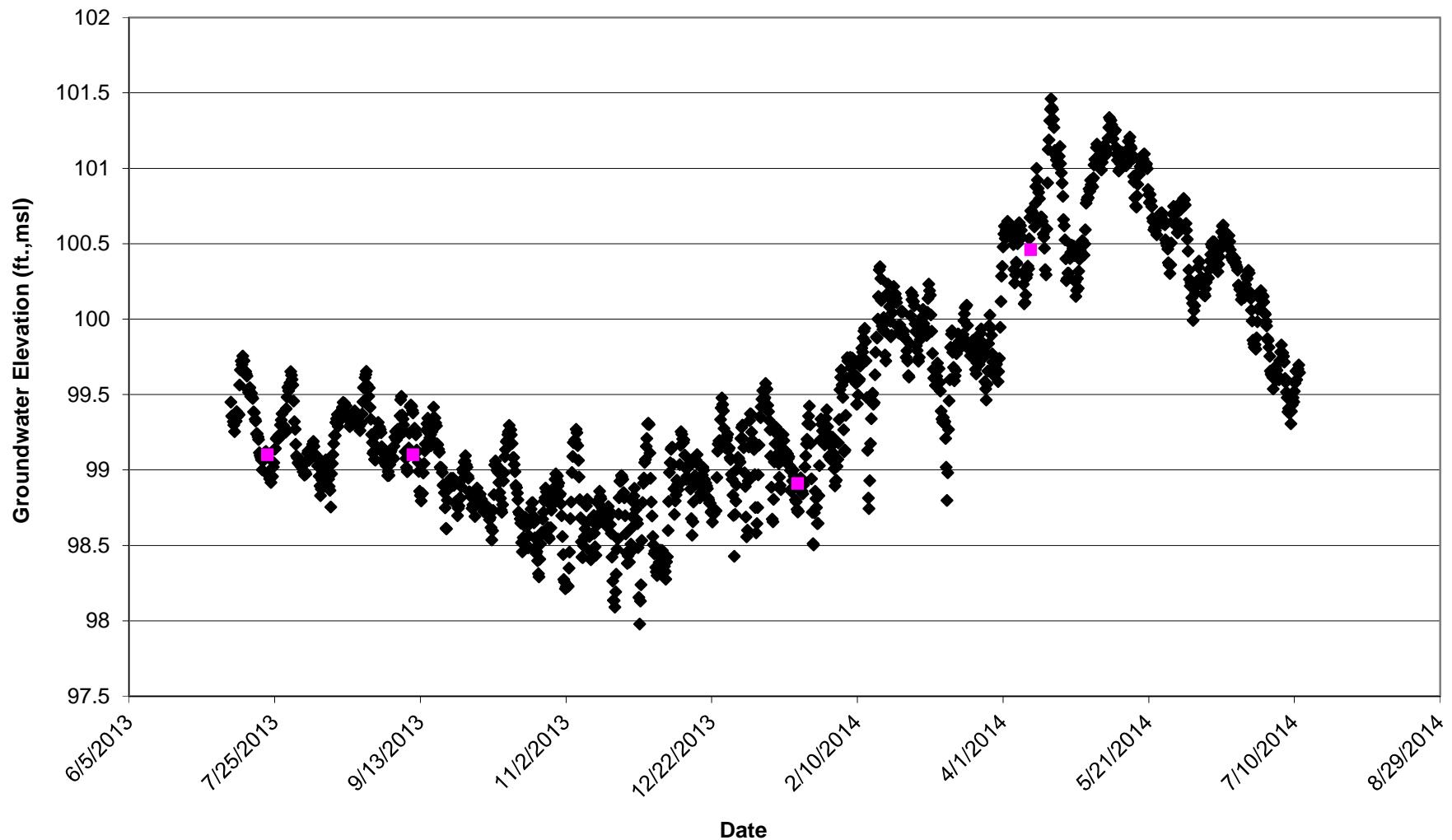
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GEMS Landfill Phase II Project
9th Annual Report



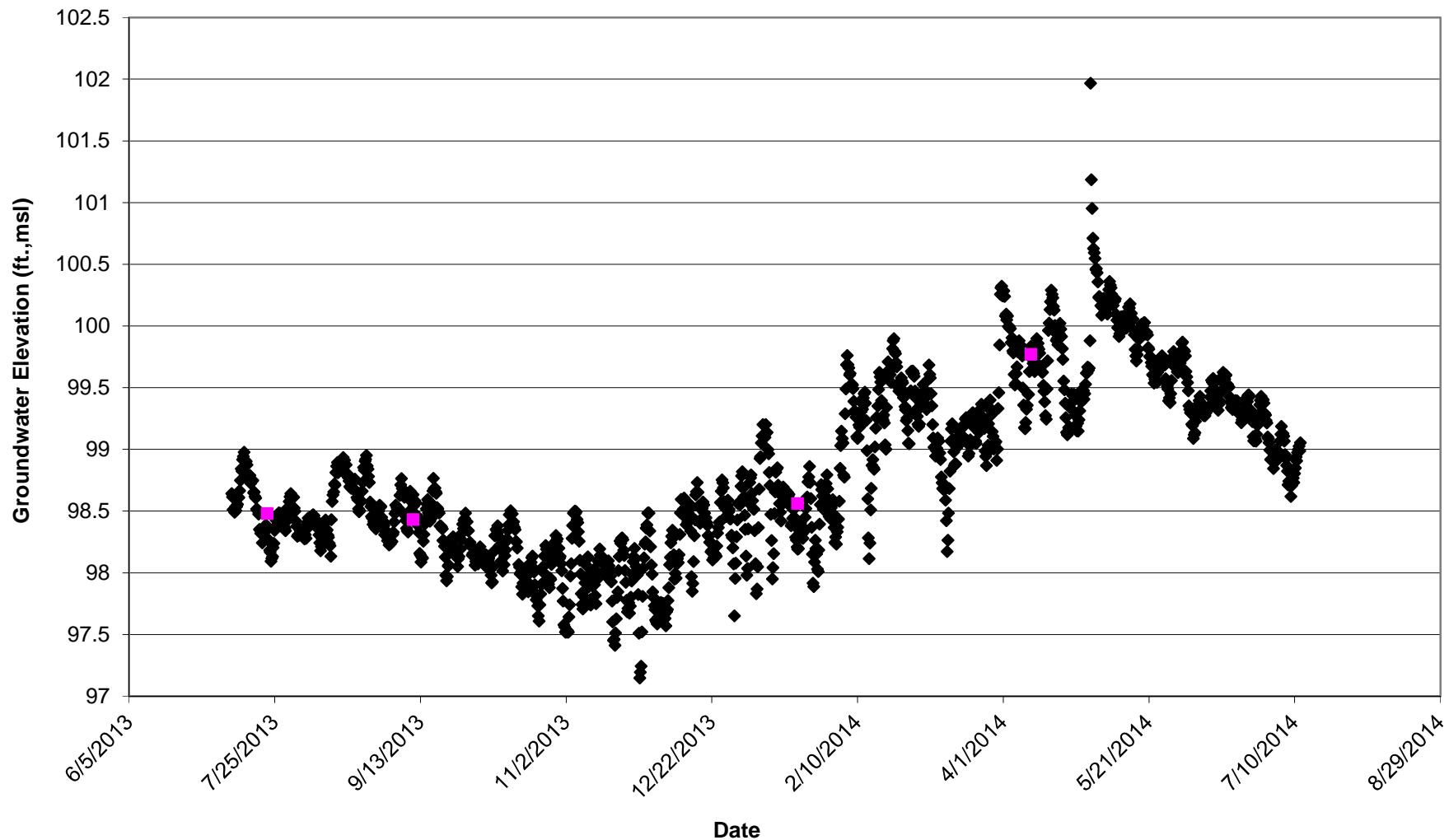
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GEMS Landfill Phase II Project
9th Annual Report



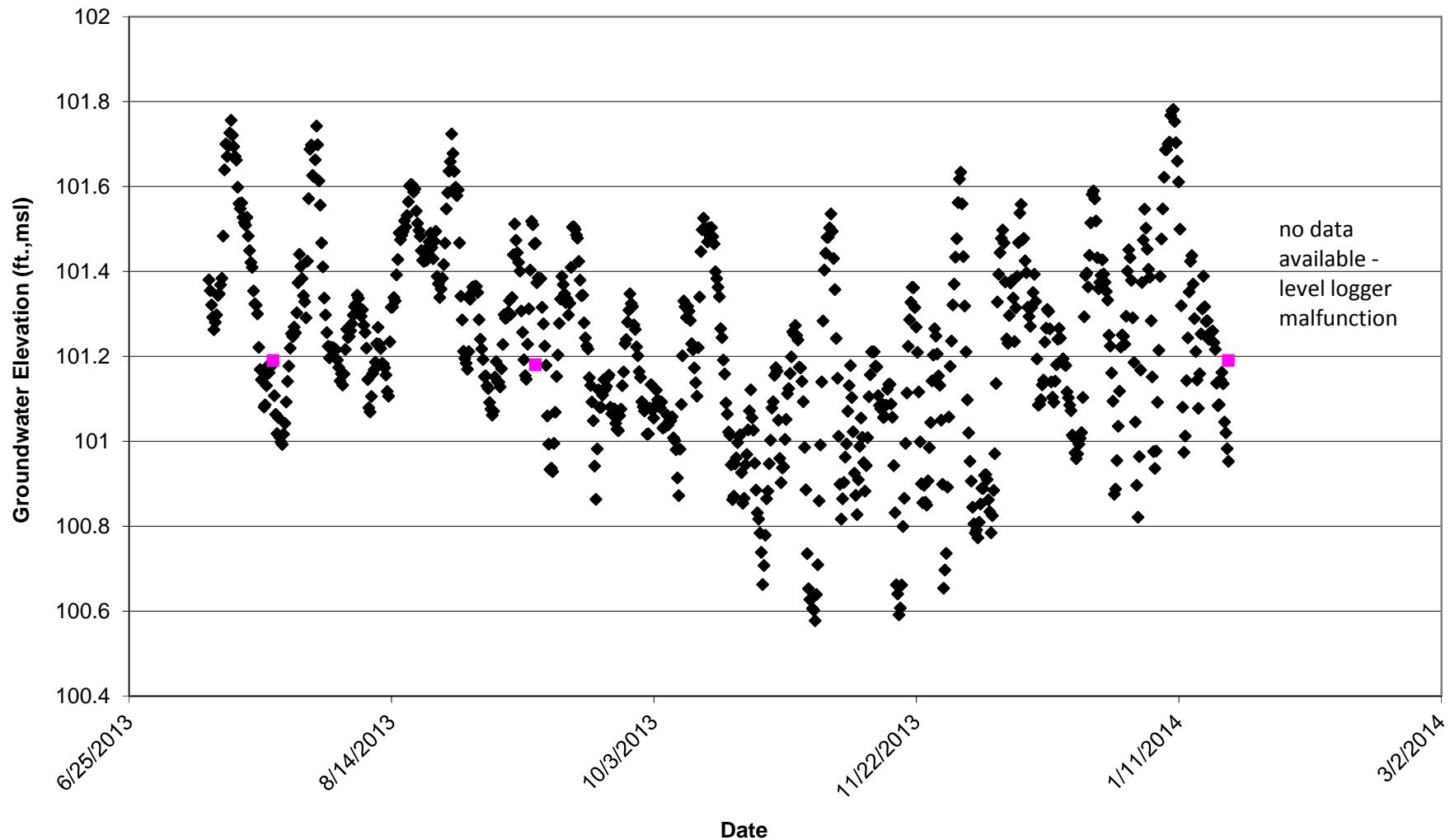
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GEMS Landfill Phase II Project
9th Annual Report



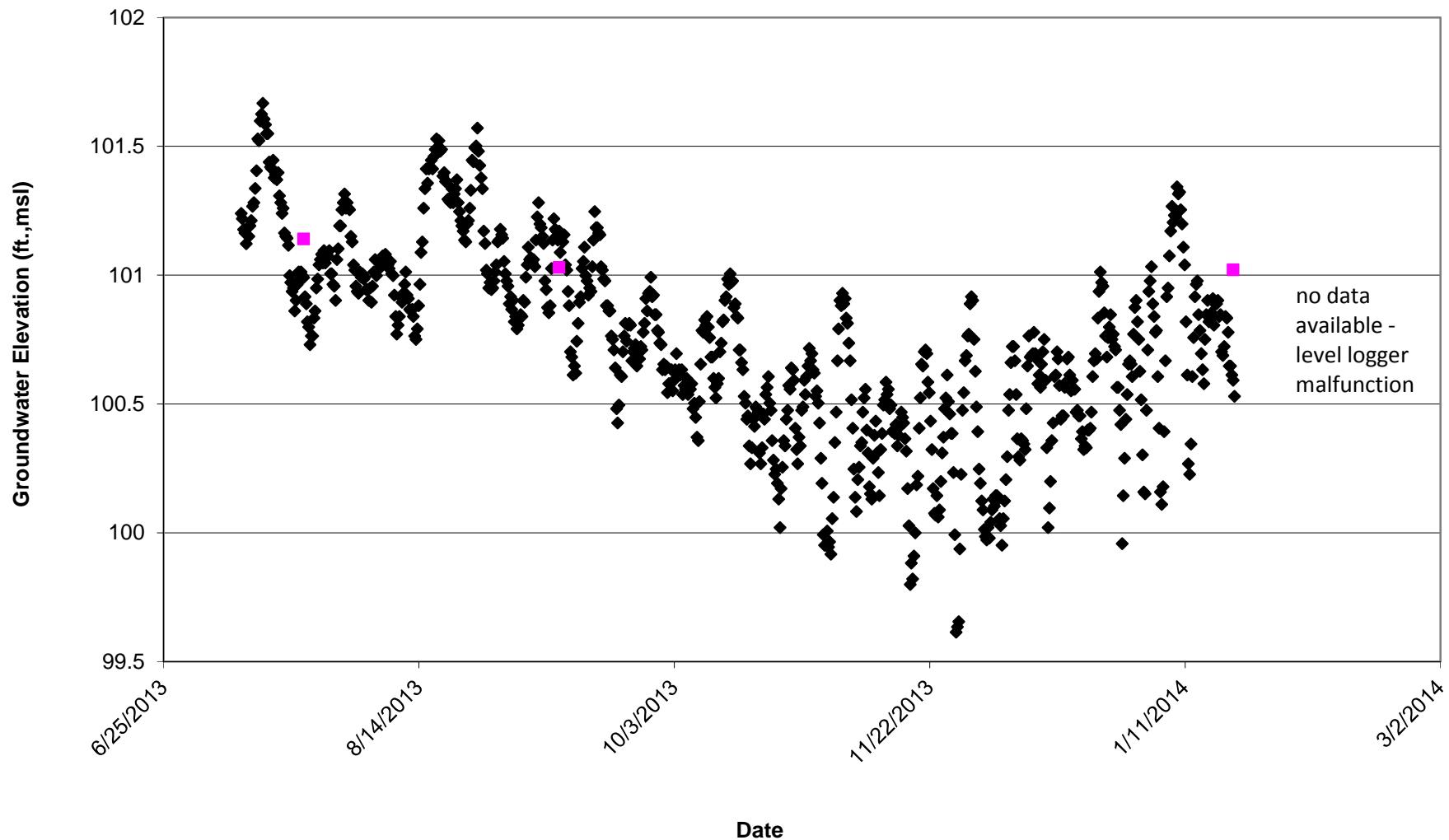
HYDROGRAPH OF PM-15
GEMS Landfill Phase II Project
9th Annual Report



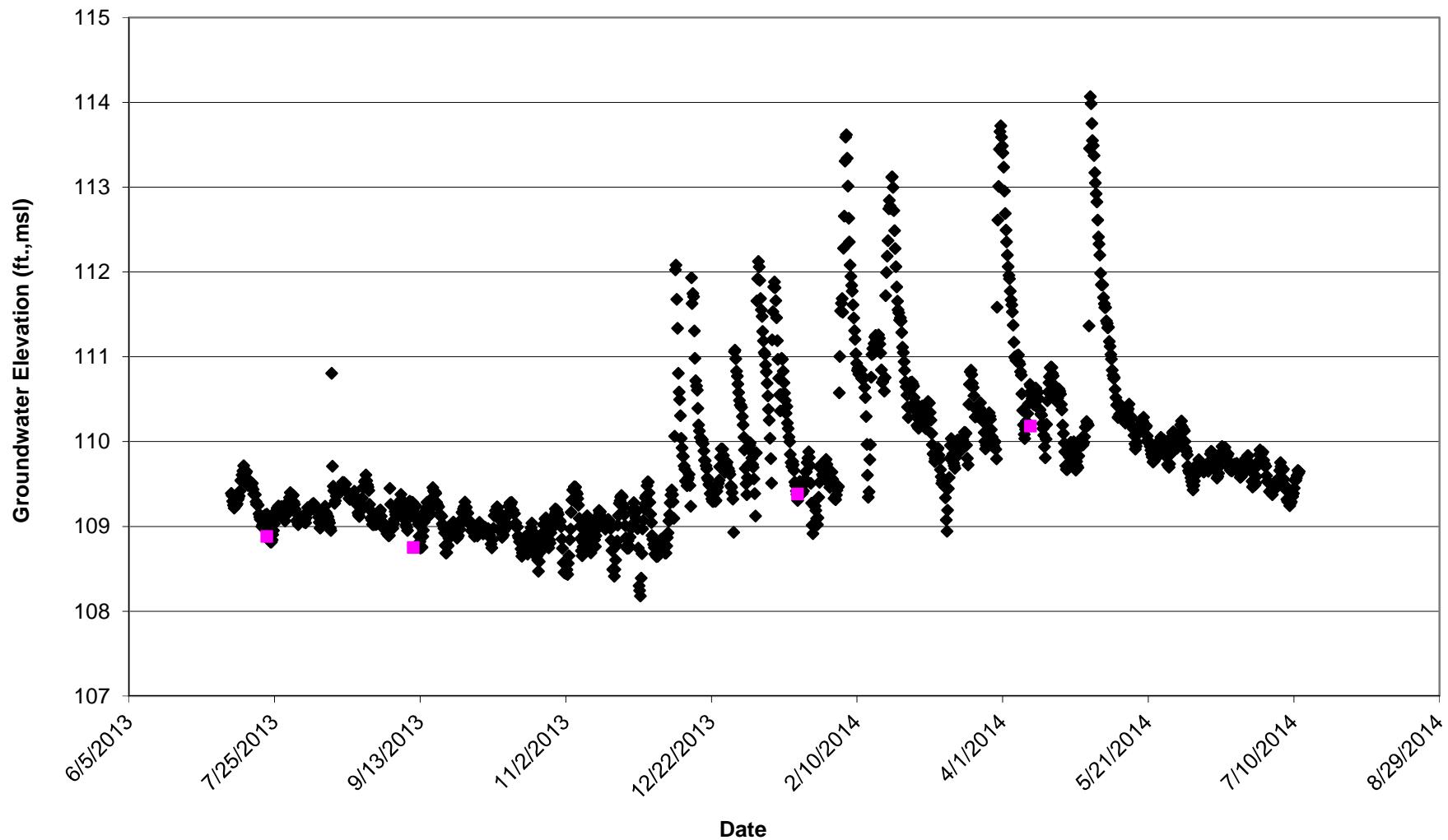
HYDROGRAPH OF PM-19
GEMS Landfill Phase II Project
9th Annual Report



HYDROGRAPH OF PM-21
GEMS Landfill Phase II Project
9th Annual Report

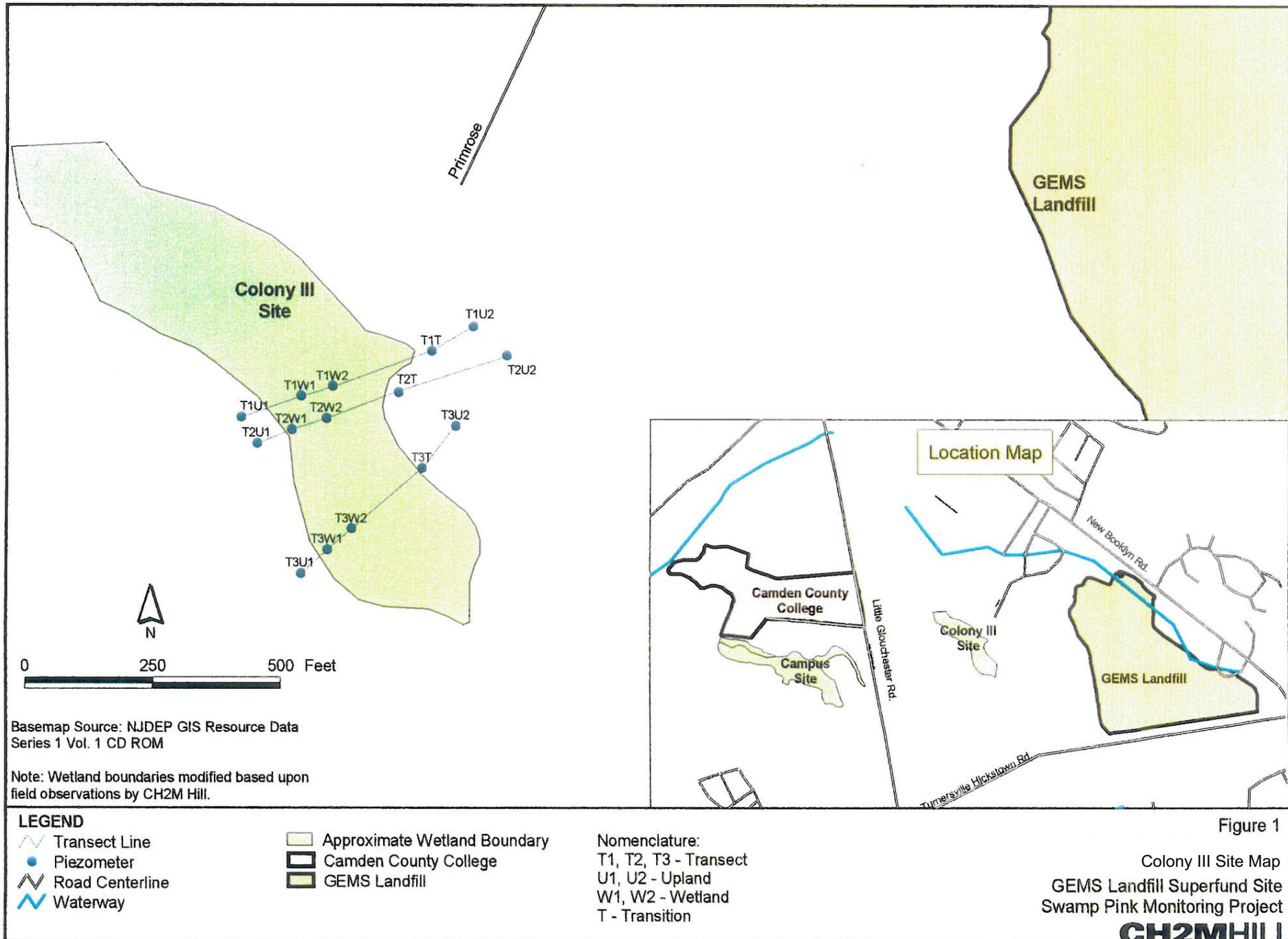


HYDROGRAPH OF PM-25
GEMS Landfill Phase II Project
9th Annual Report



APPENDIX B

SWAMP PINK PIEZOMETER HYDROGRAPHS



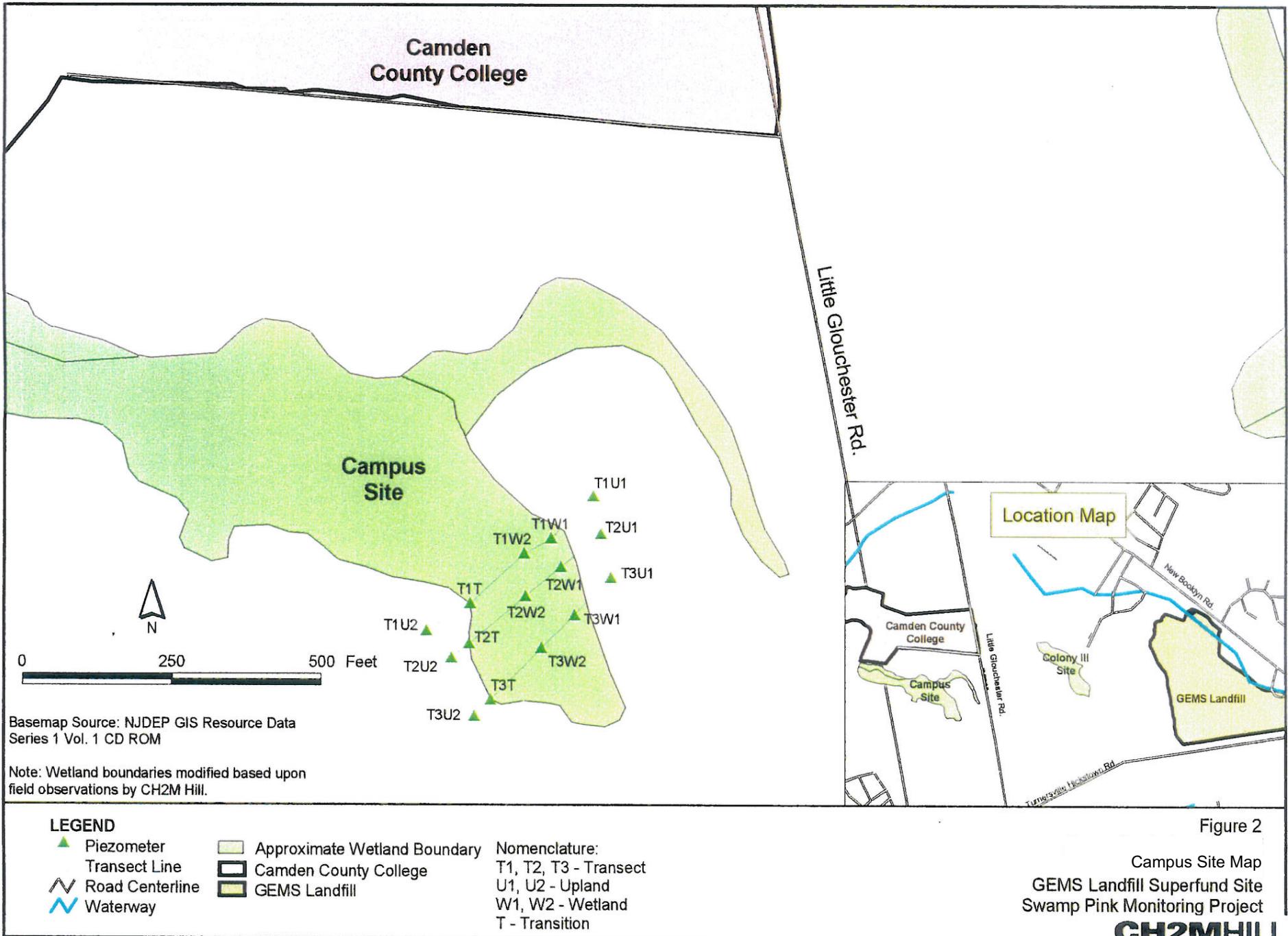


FIGURE 3
Long-term Water Level Observations at the Colony III Site (June 1998 - March 2014)

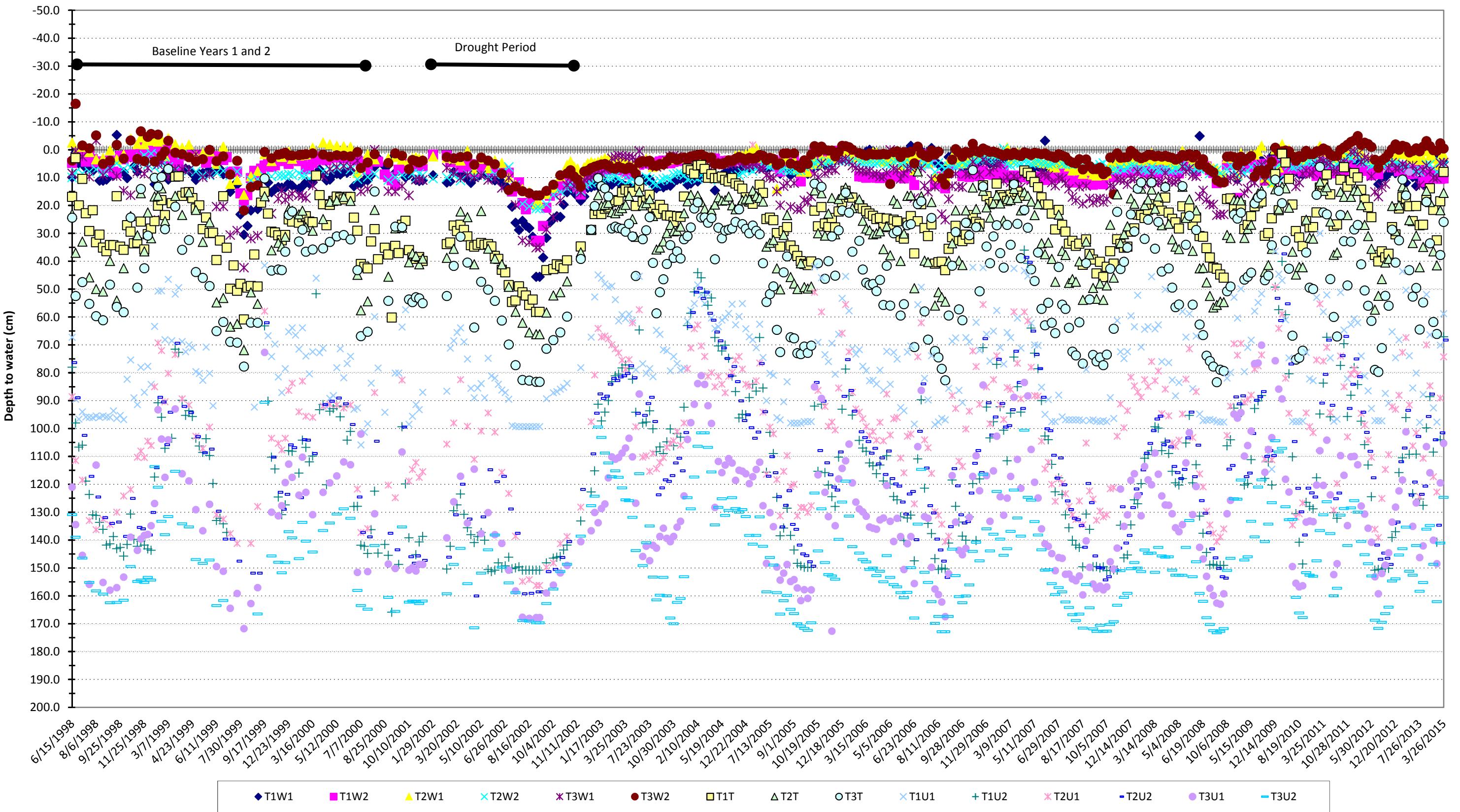
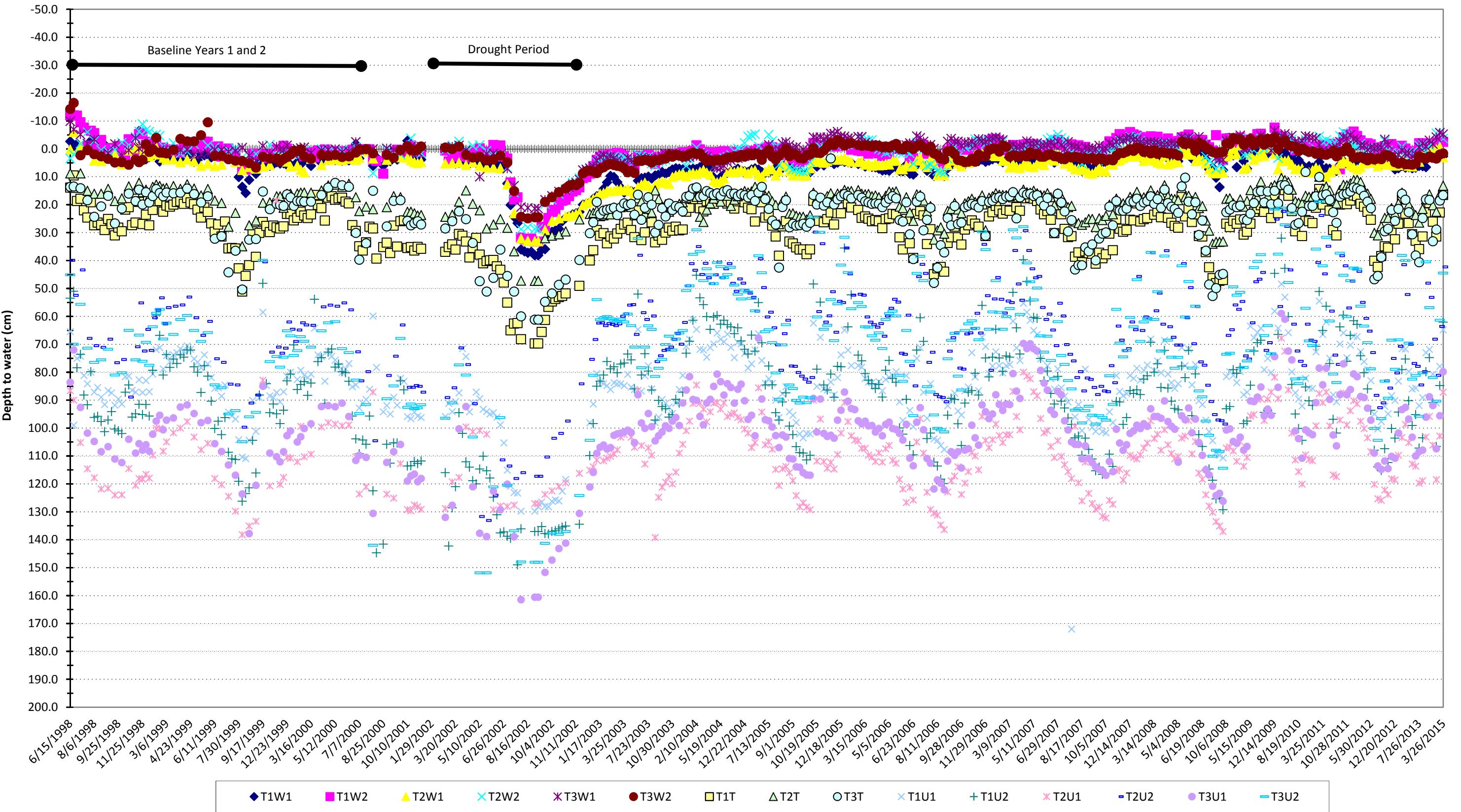


FIGURE 4

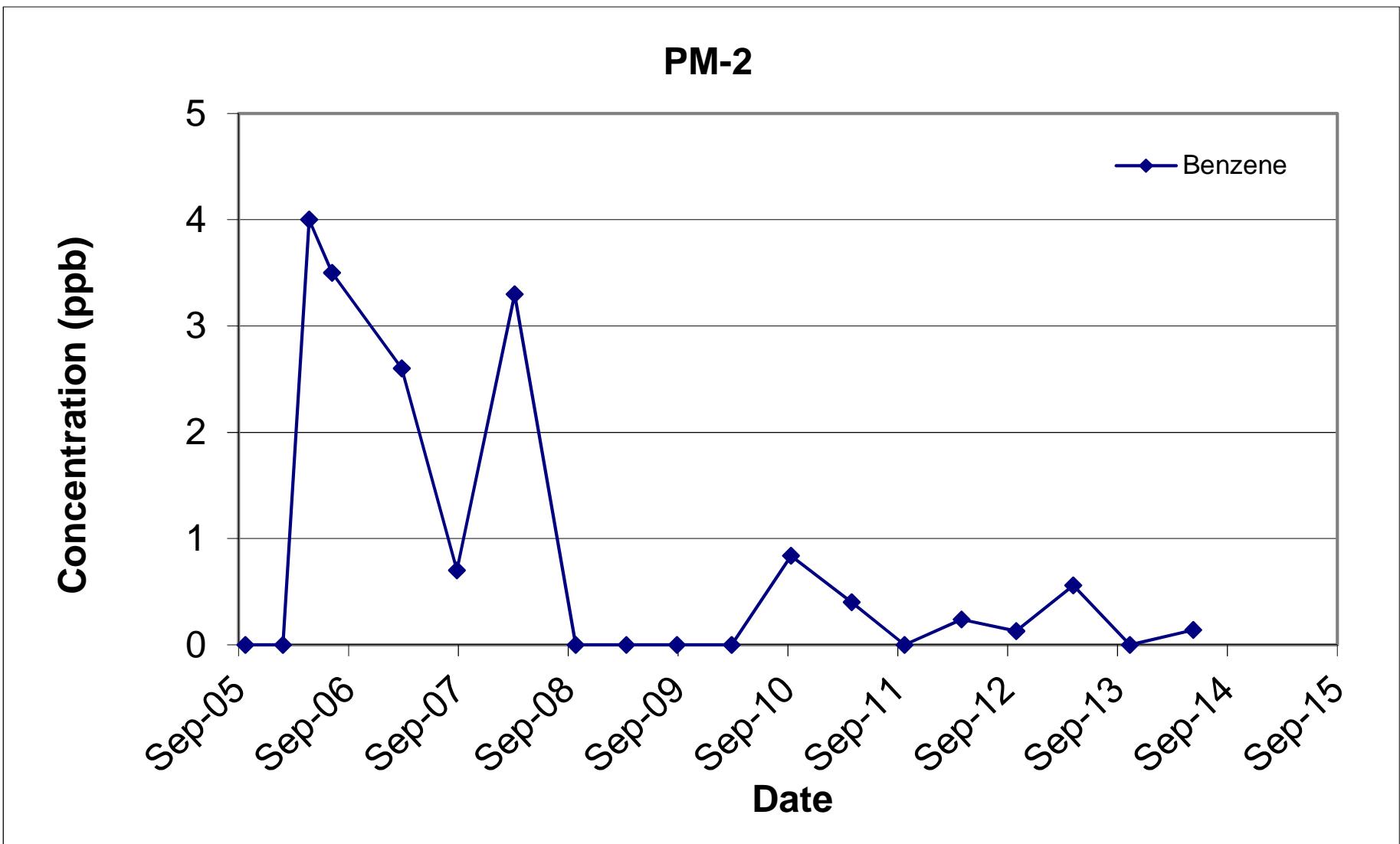
Long-term Water Level Observations at the Campus Site (June 1998 - March 2014)

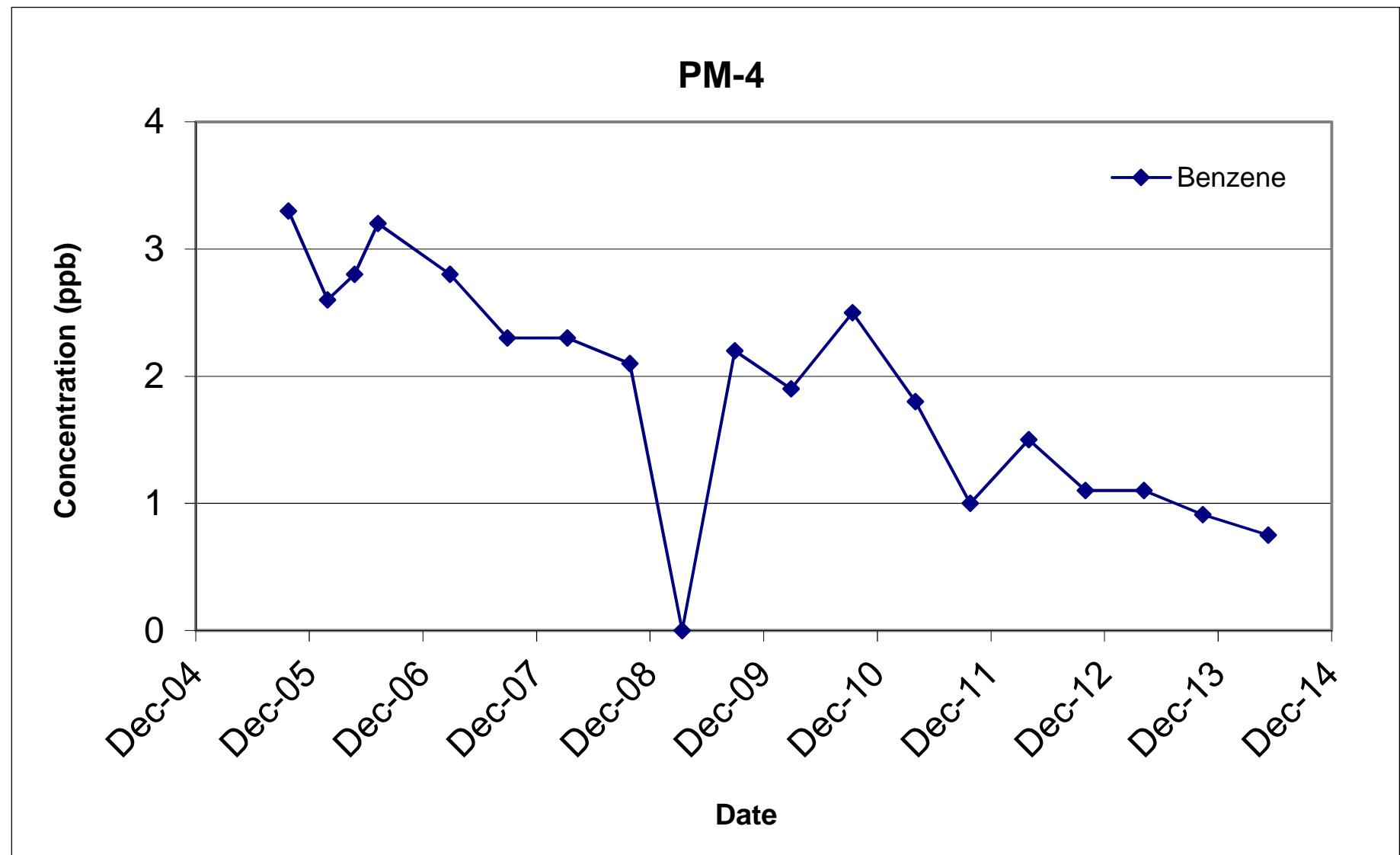


APPENDIX C

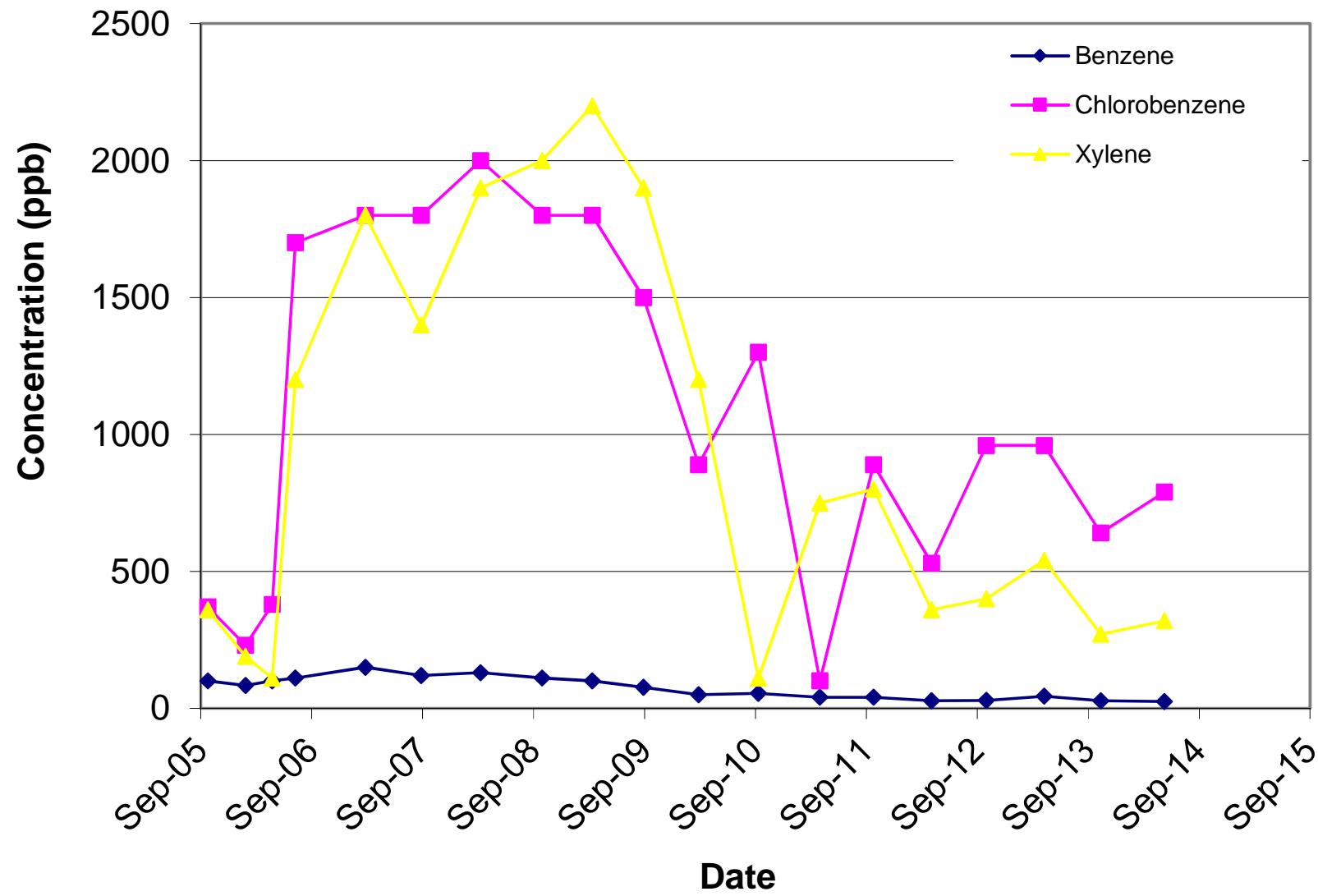
GROUNDWATER QUALITY GRAPHS

VOLATILE ORGANIC CONSTITUENT TREND PLOTS

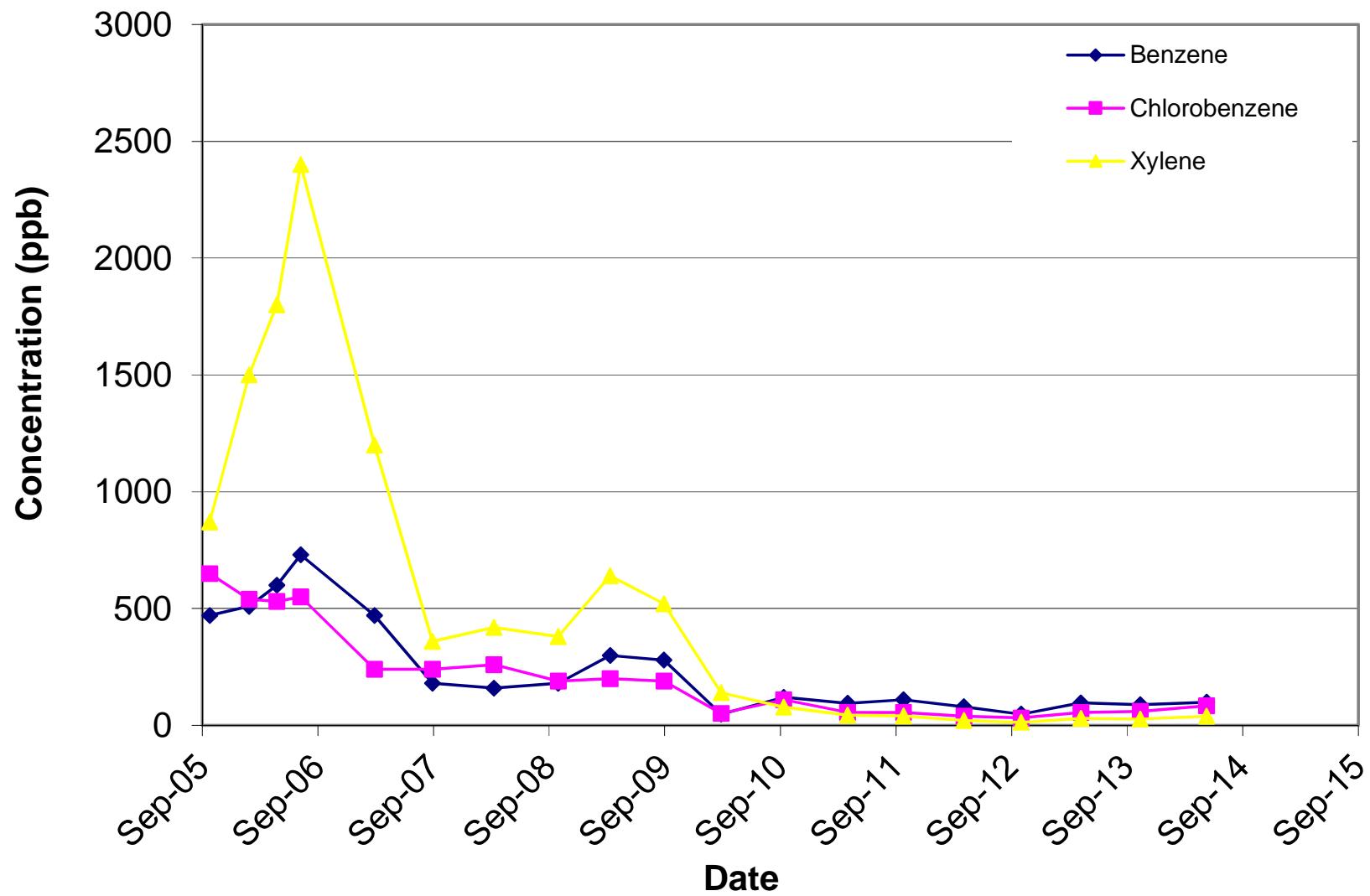


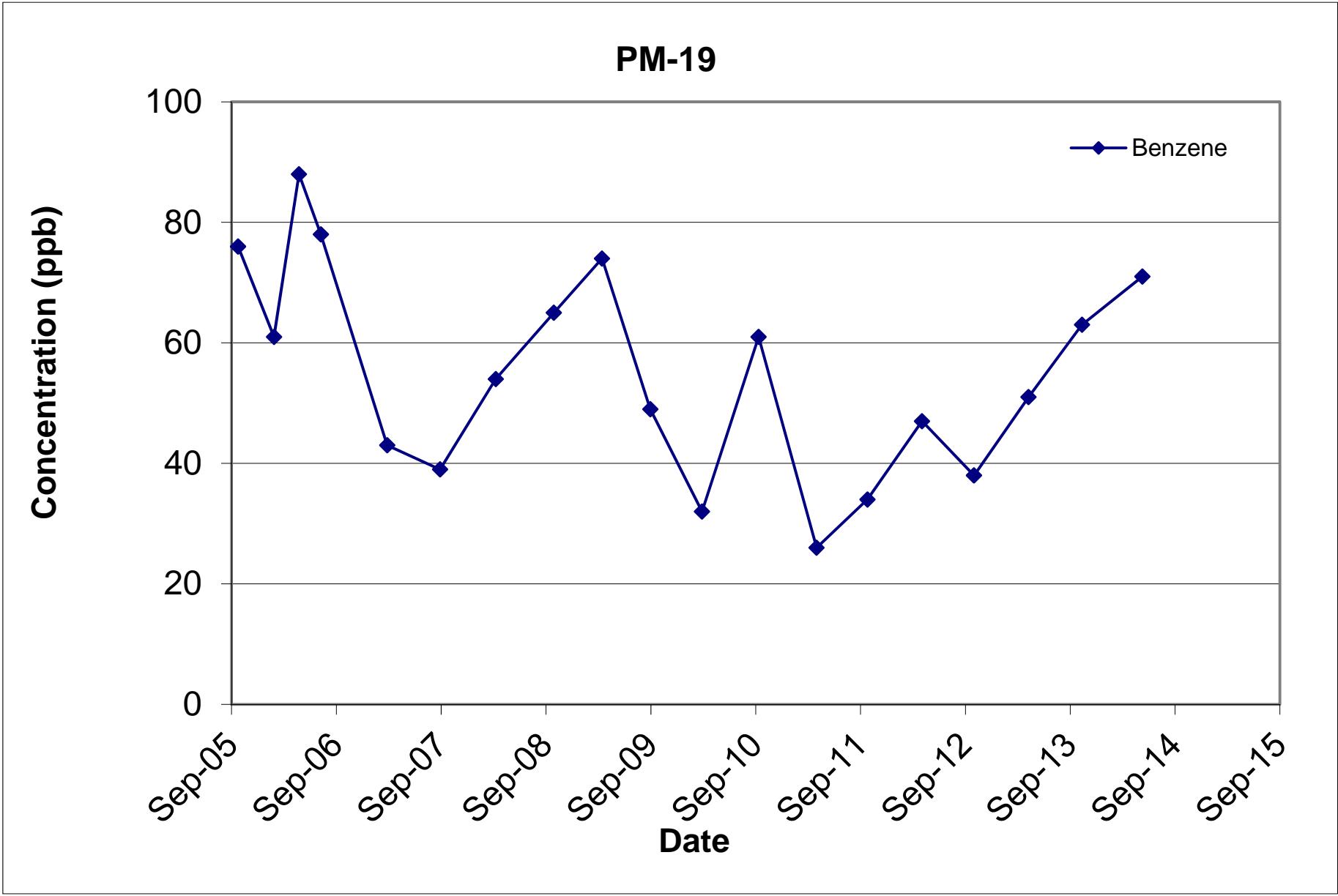


PM-13

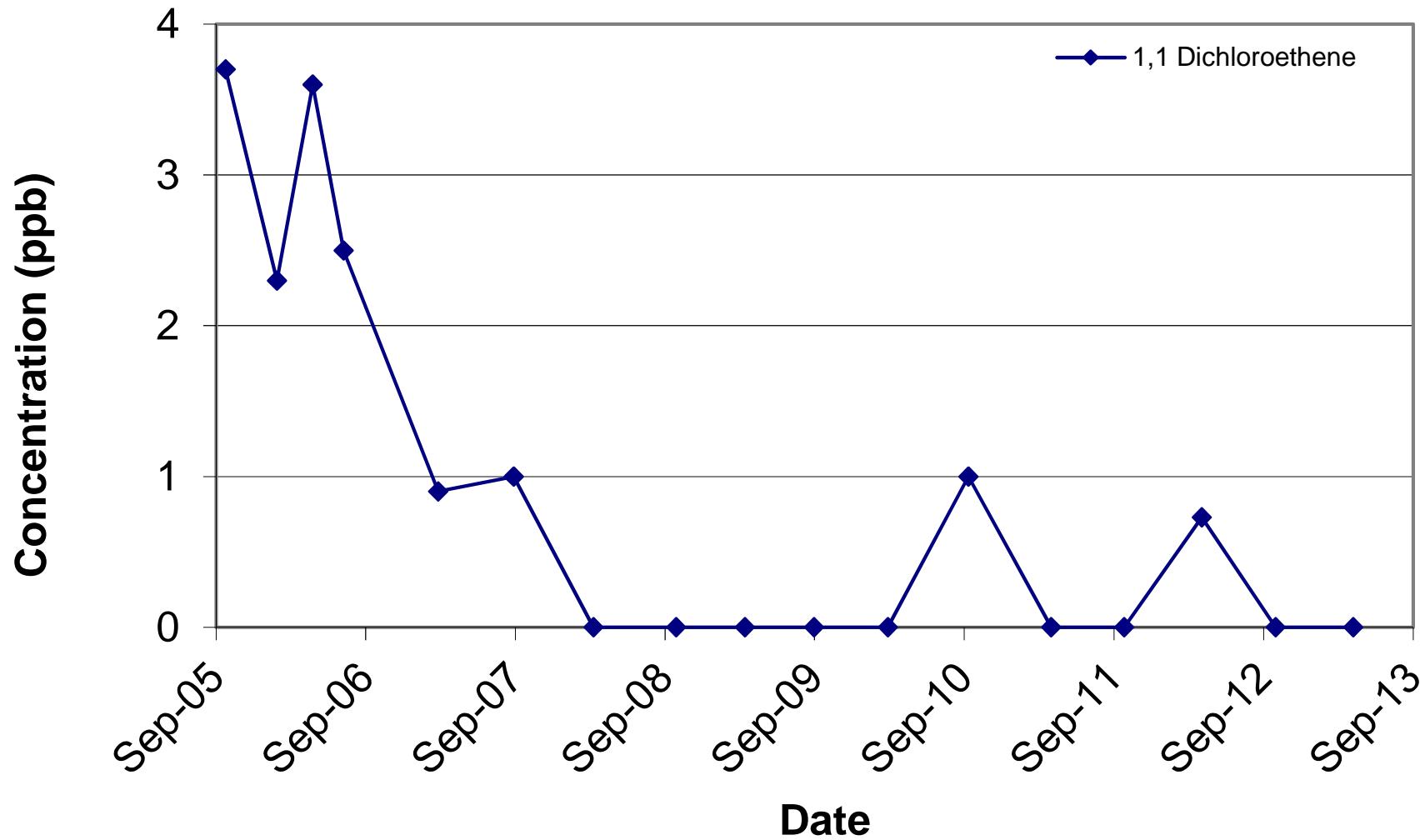


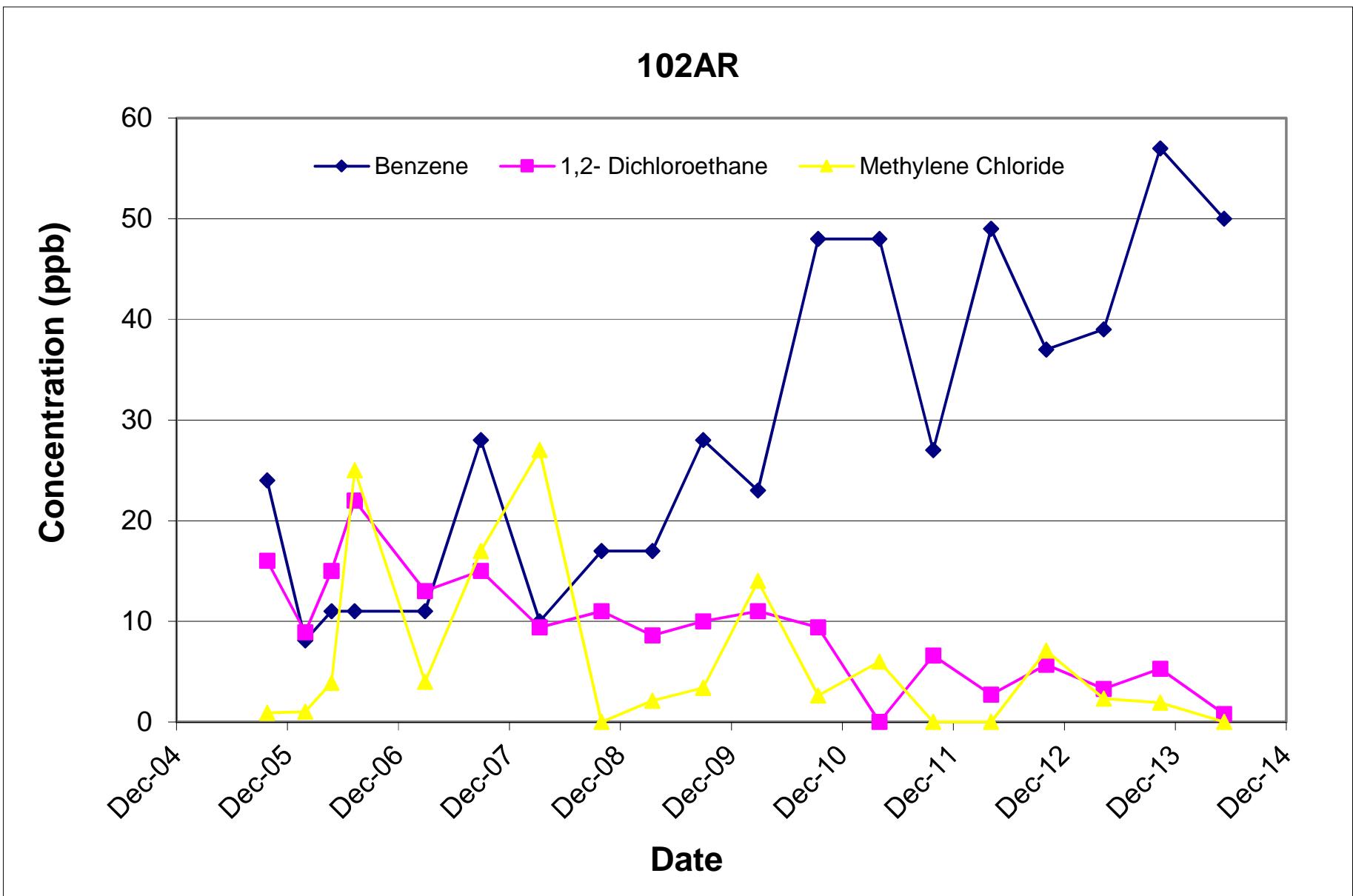
PM-16

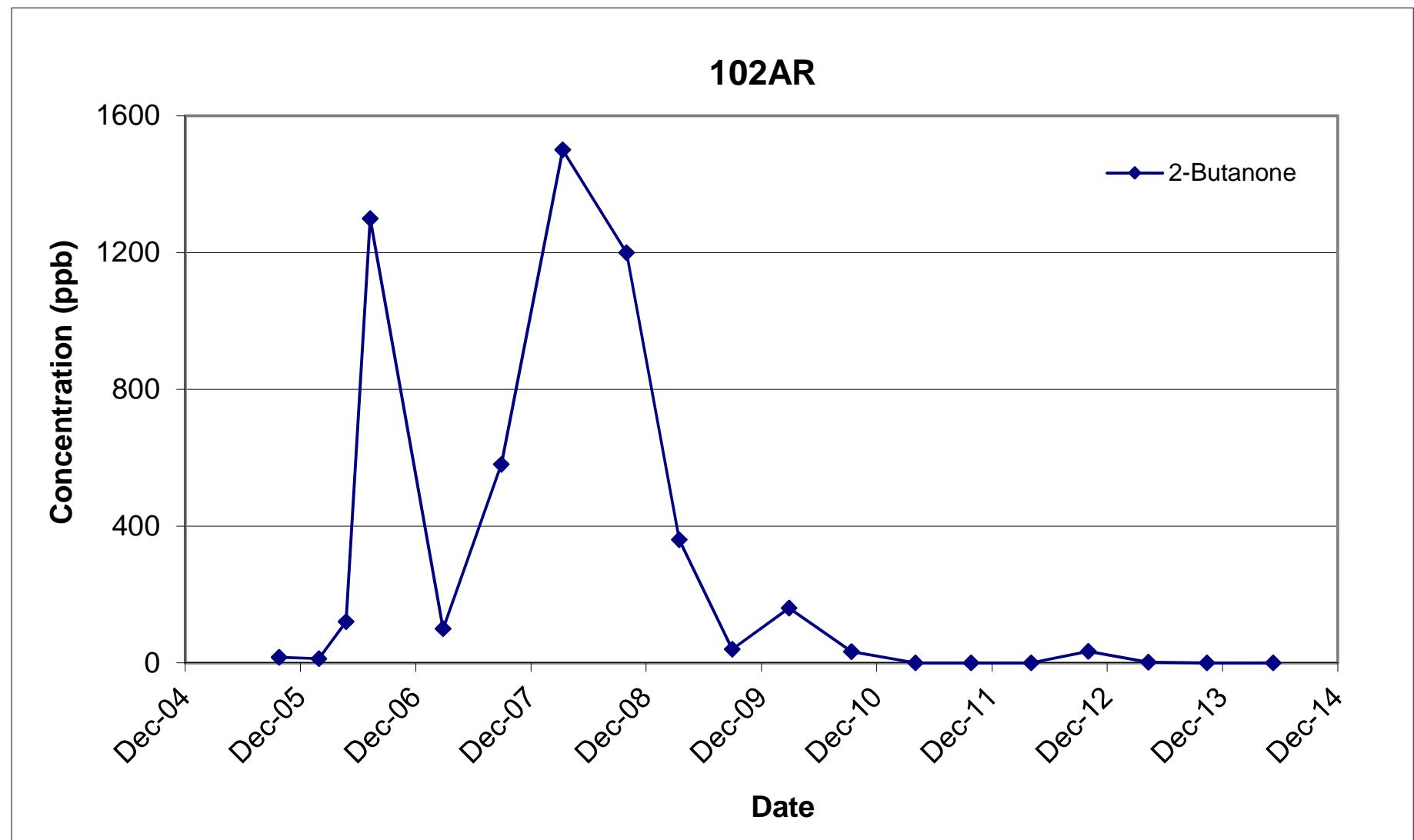




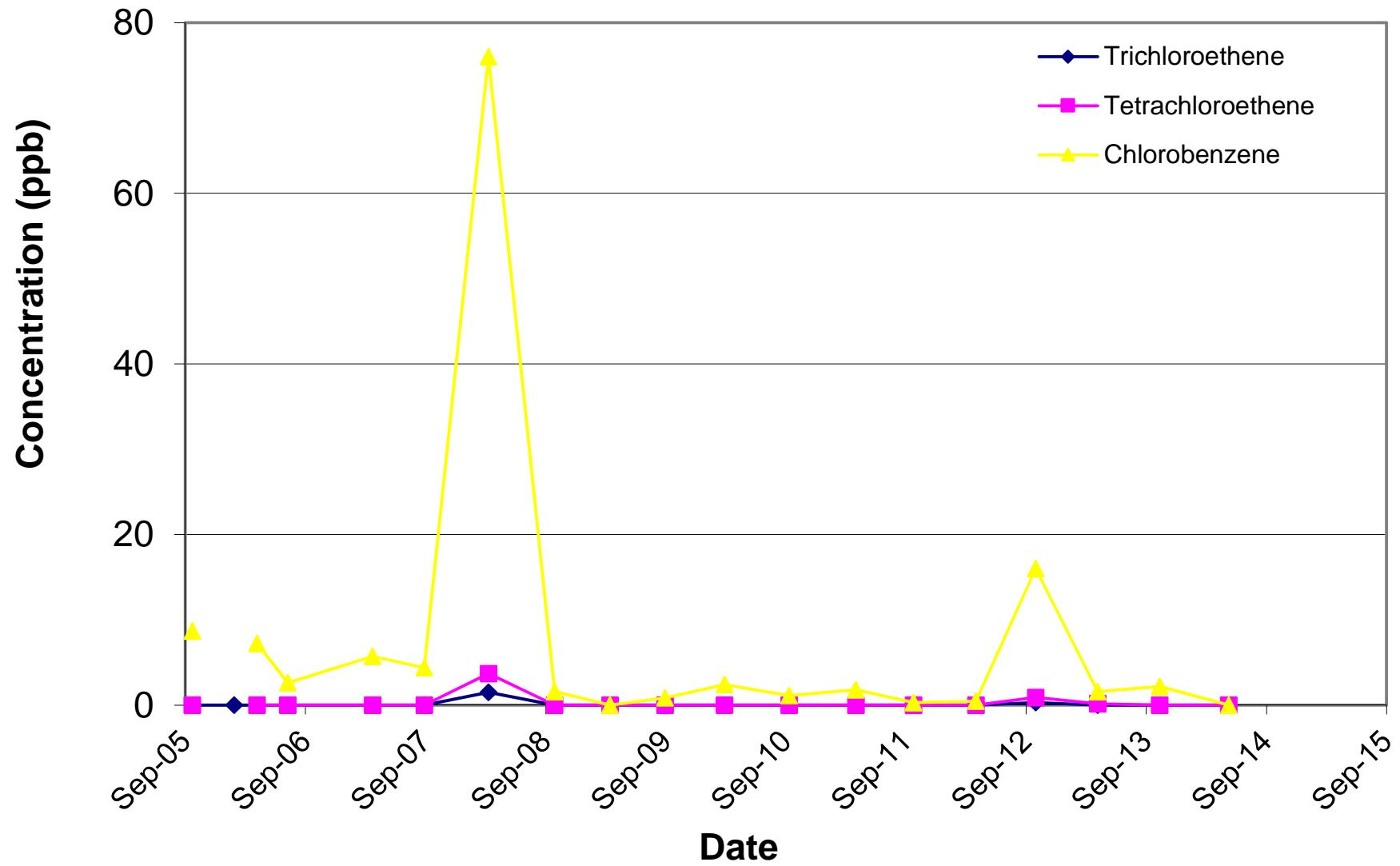
PM-30







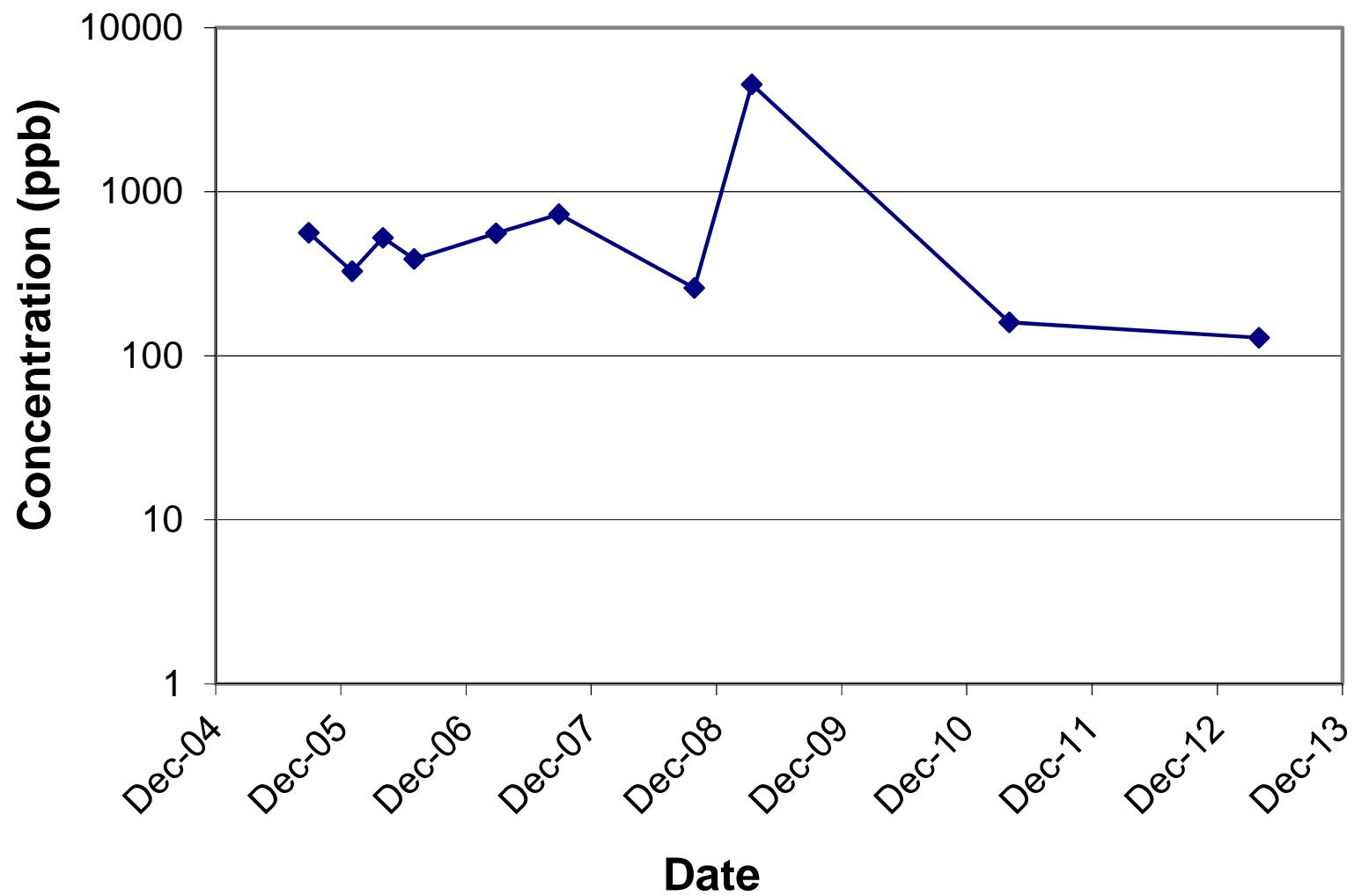
1008D



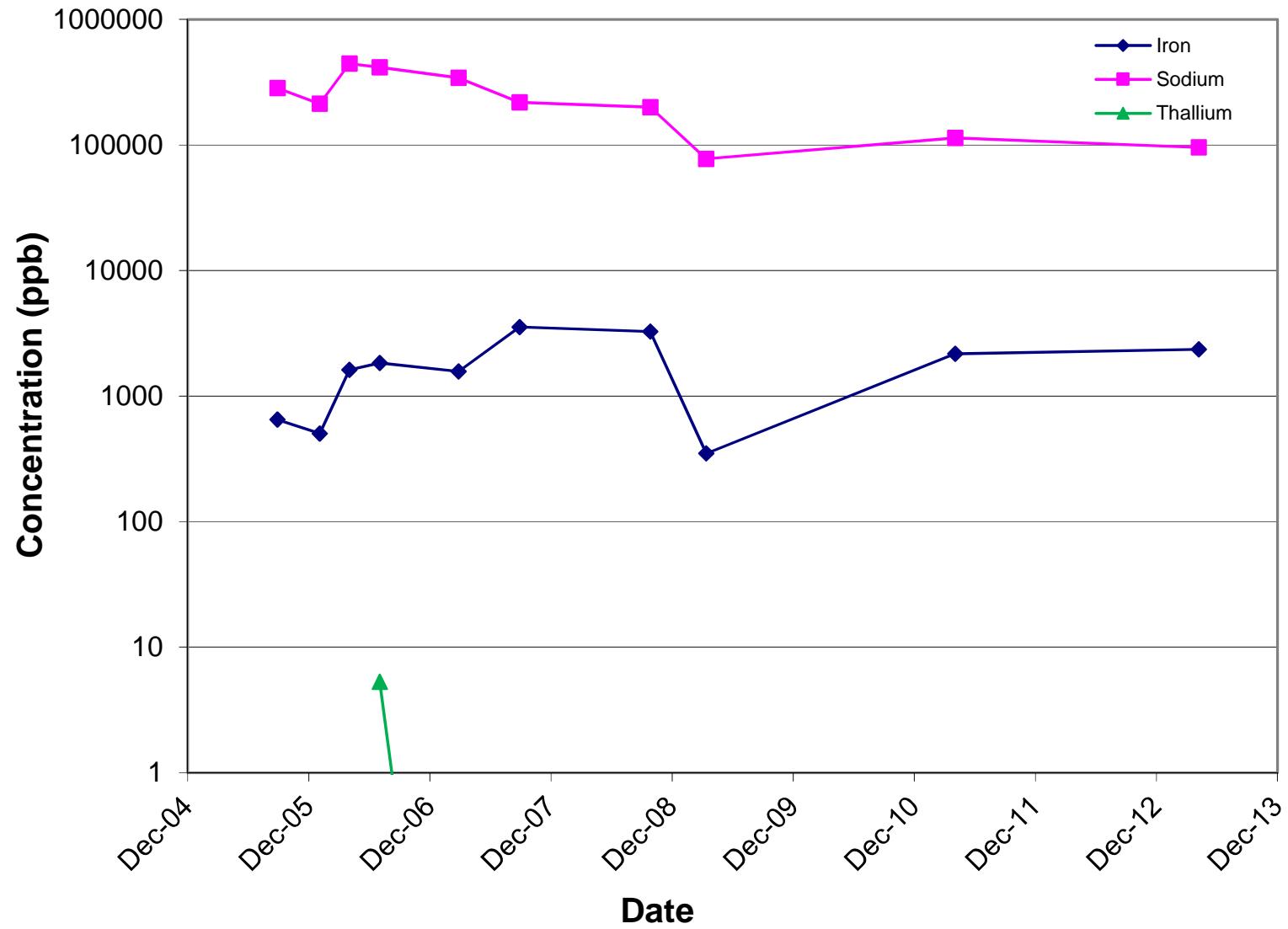
INORGANIC CONSTITUENT TREND PLOTS

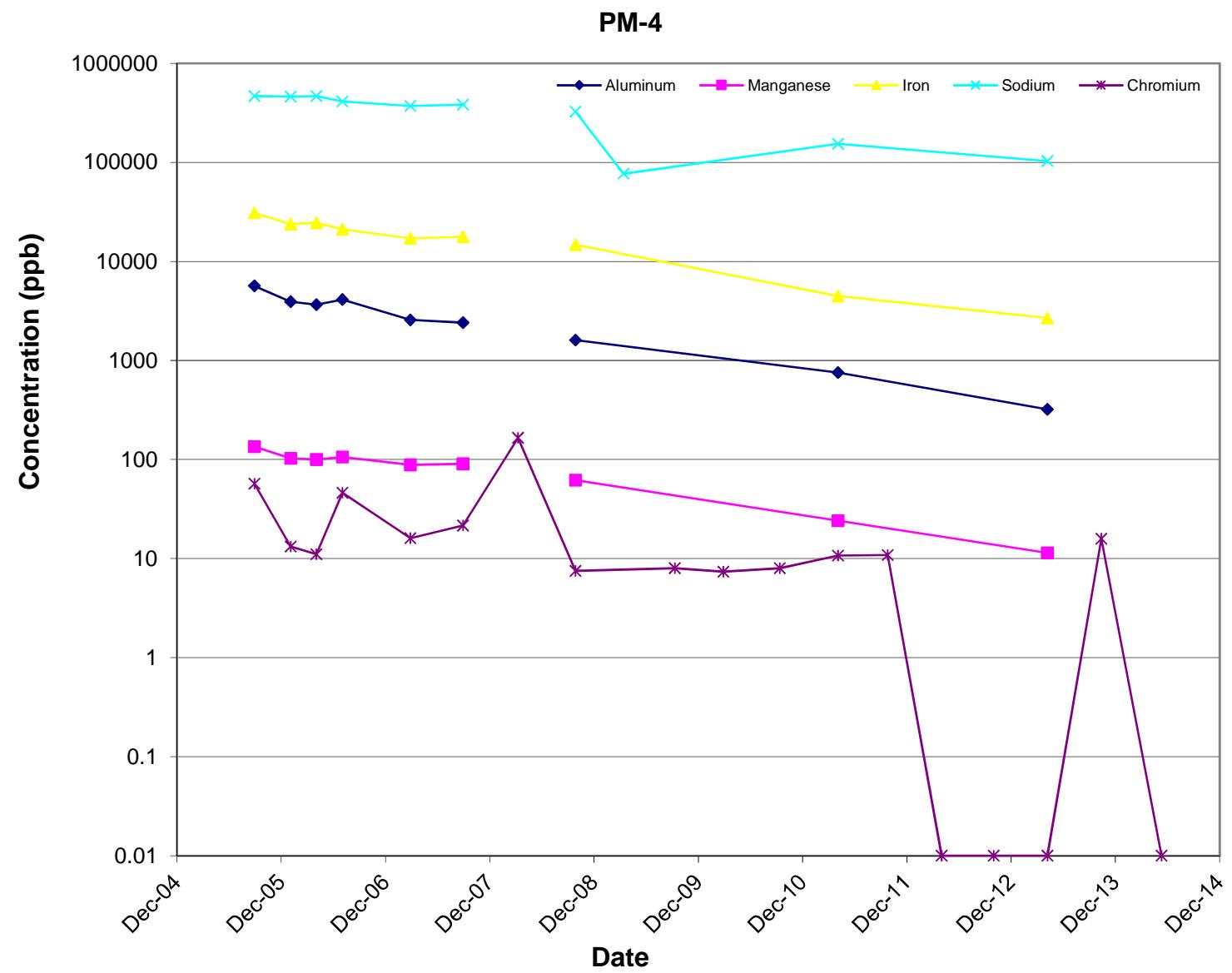
PM-1

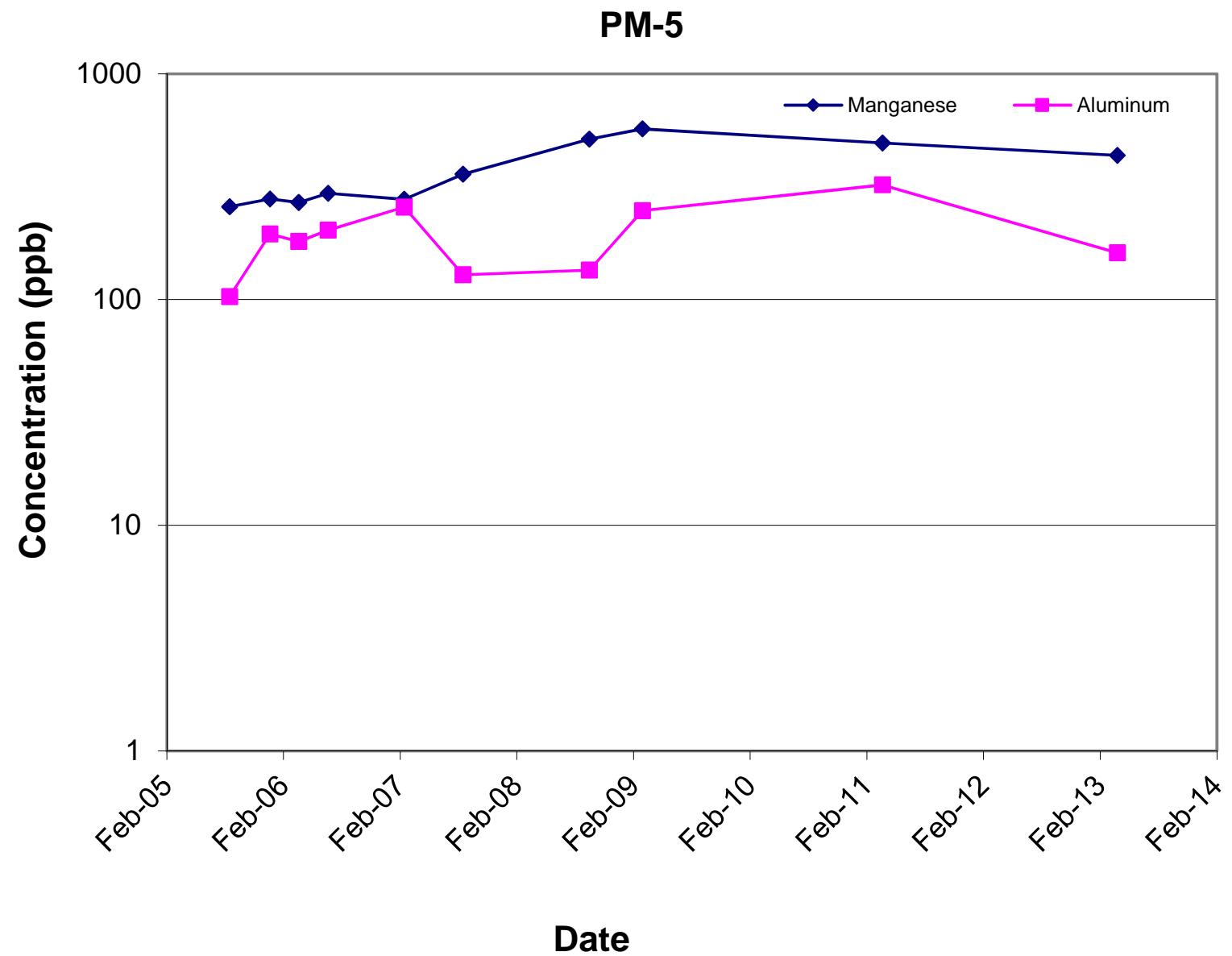
Aluminum



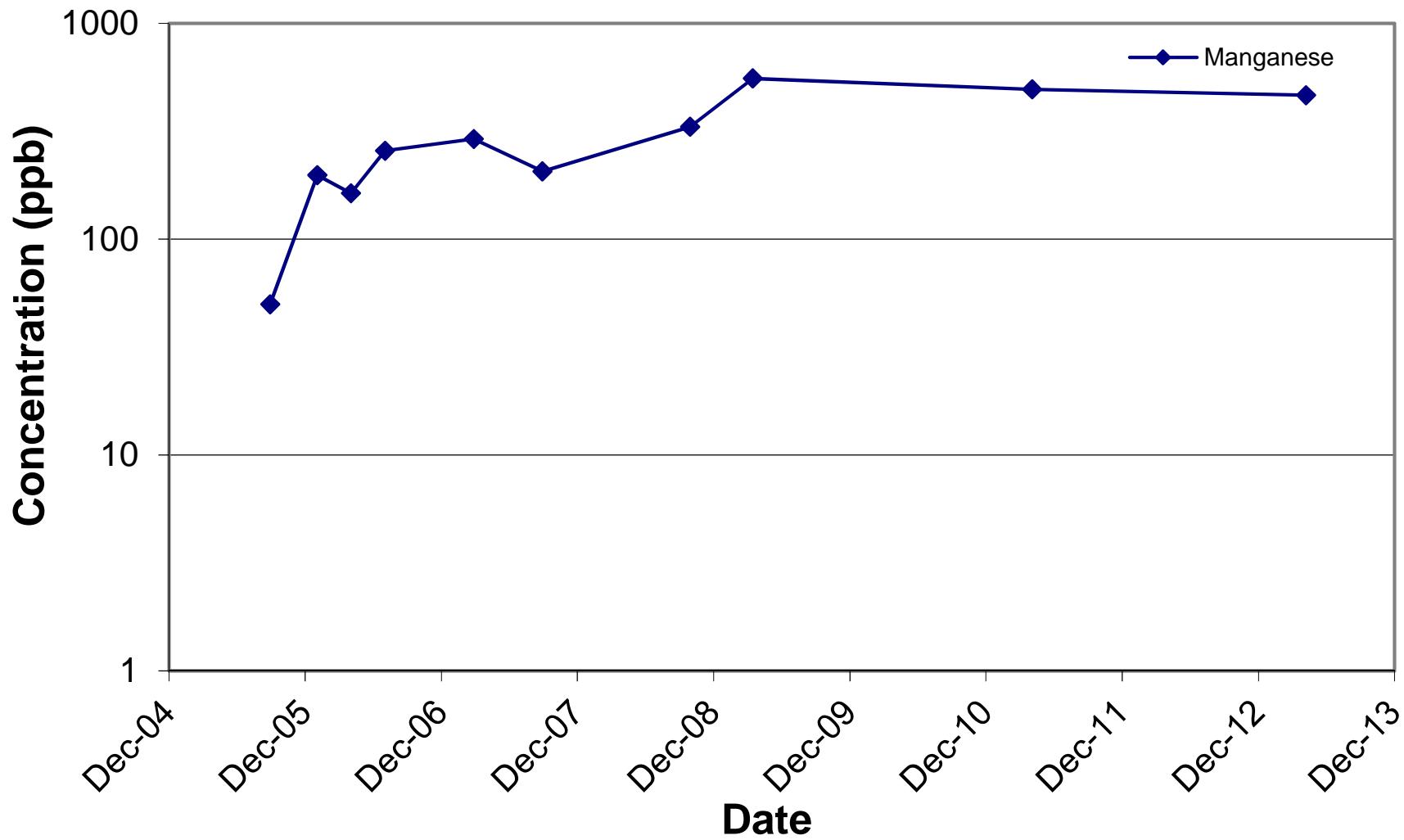
PM-2

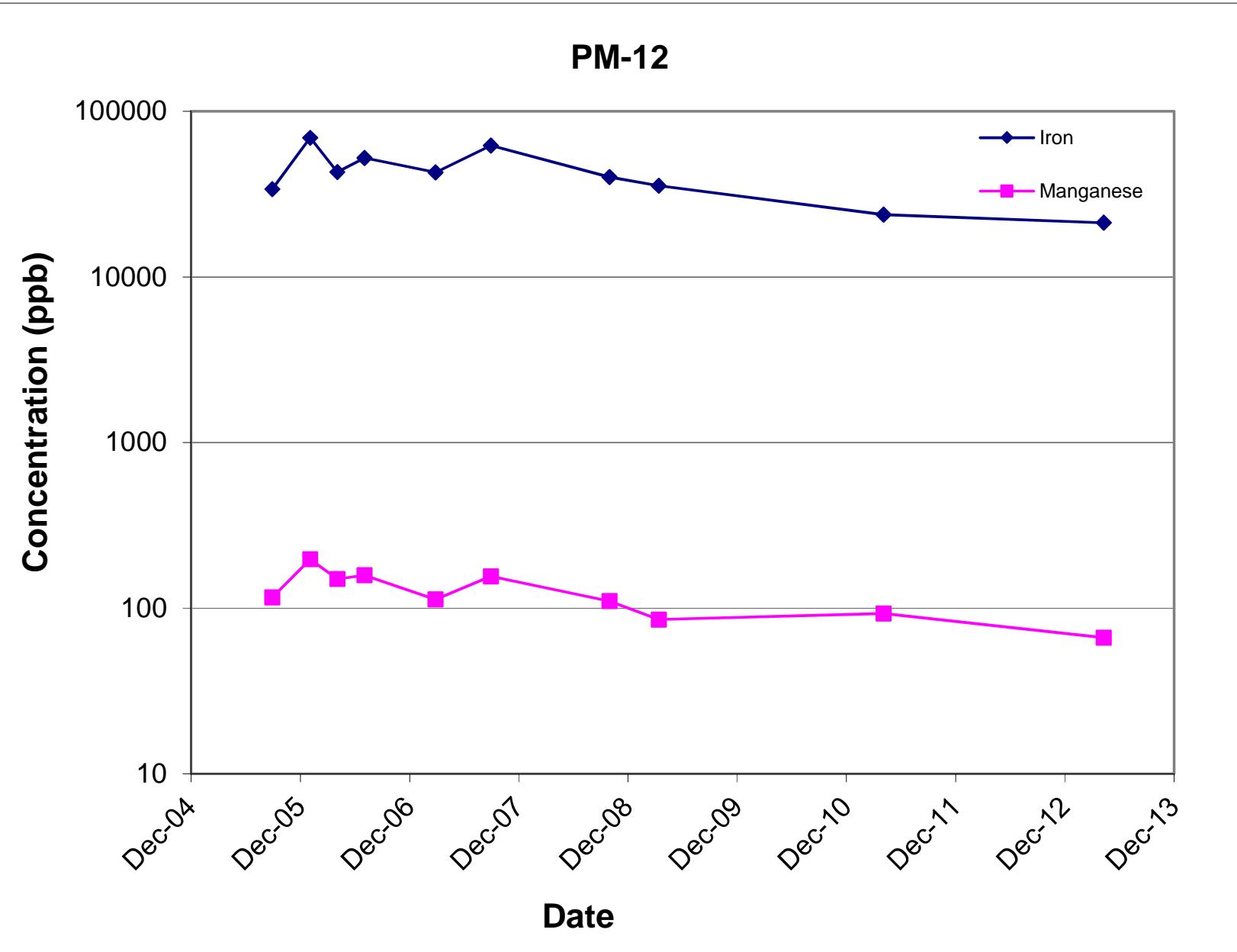




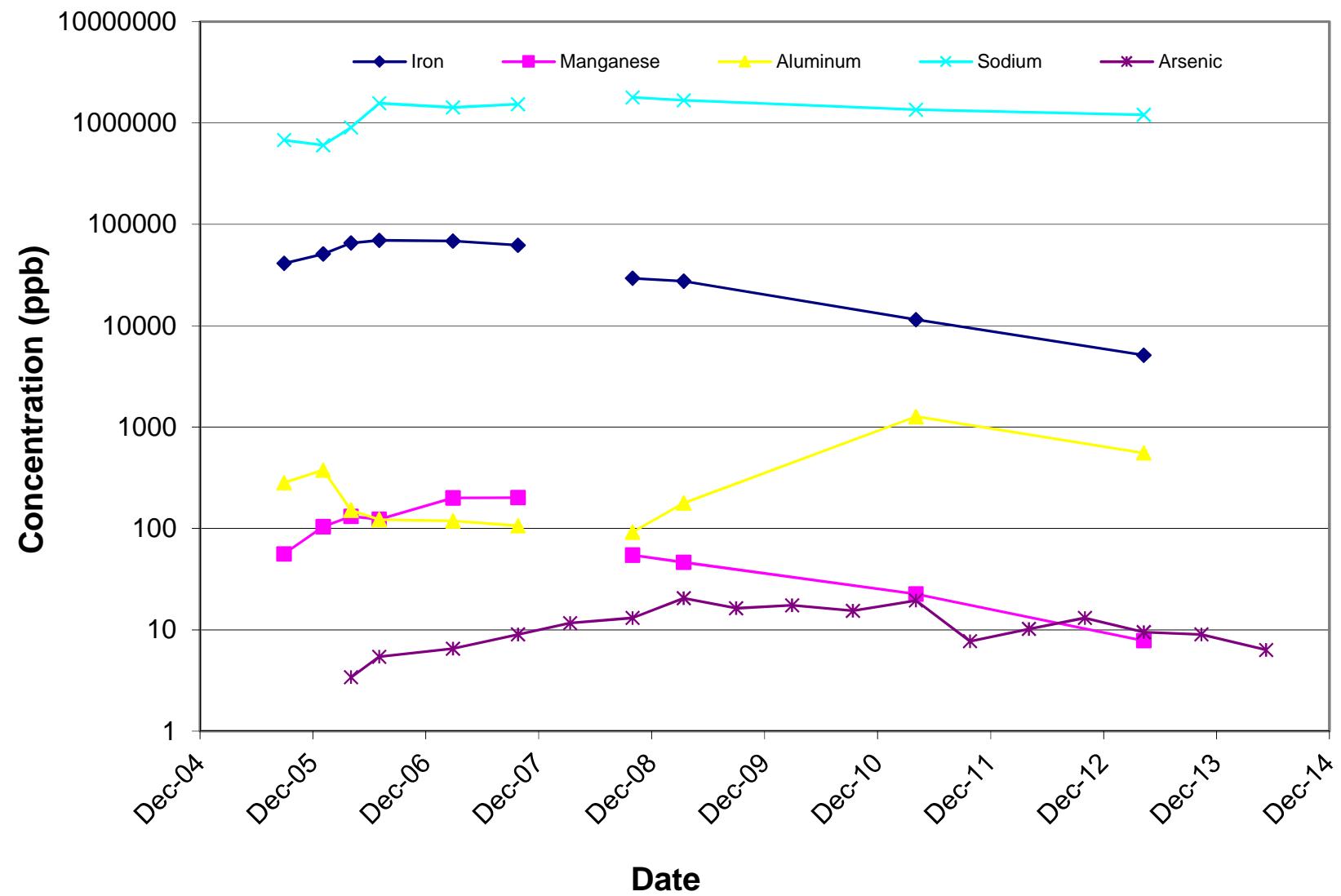


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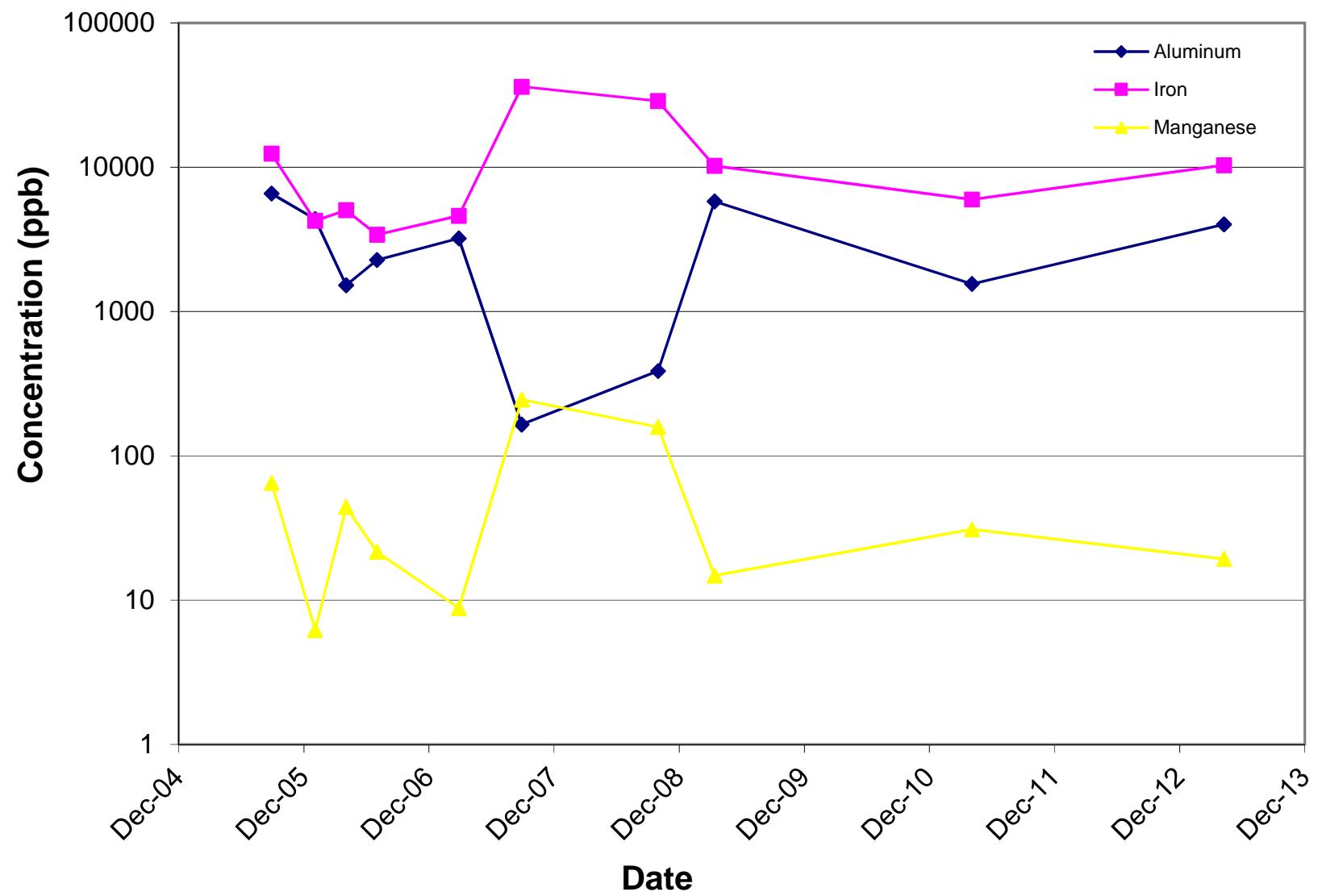


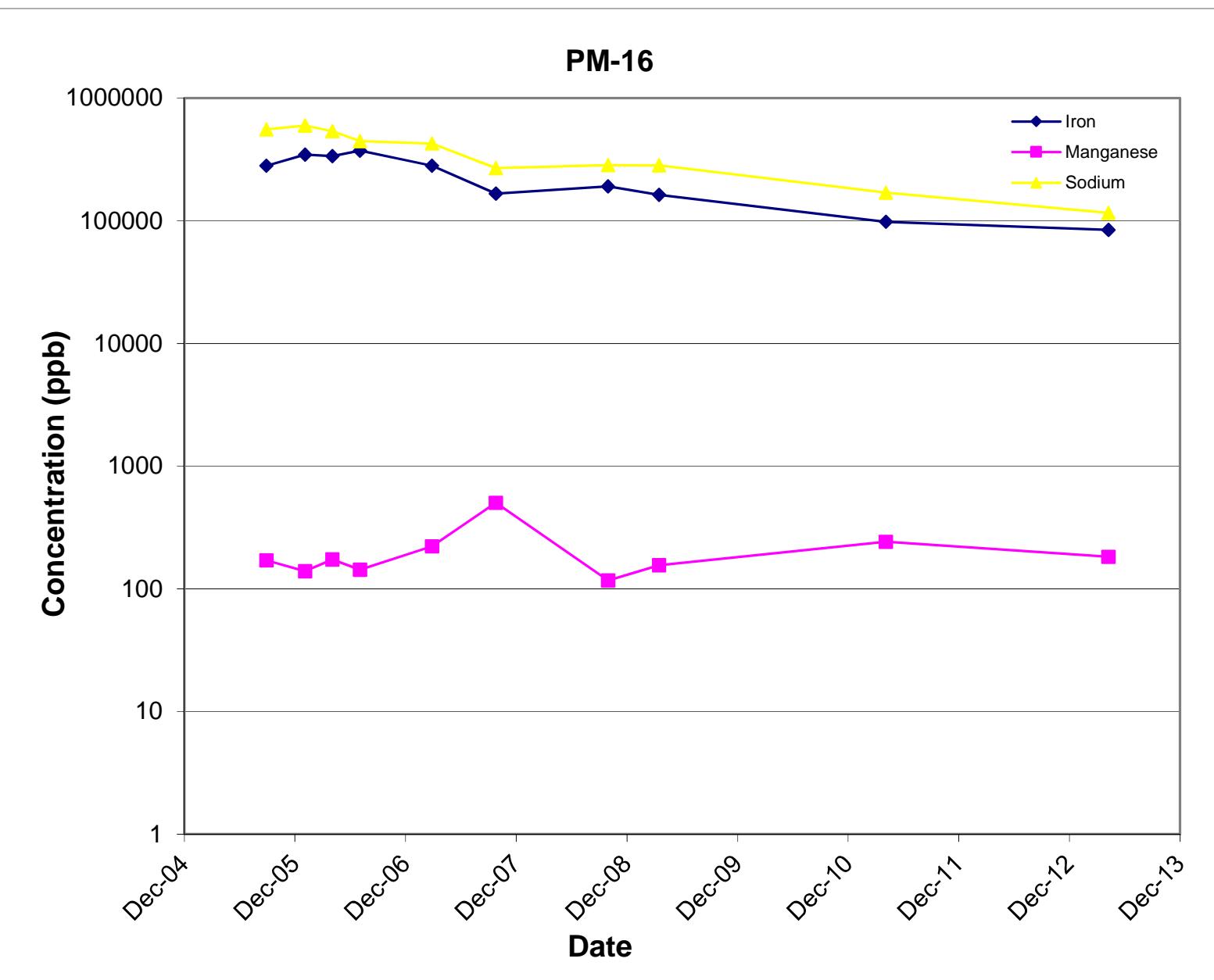


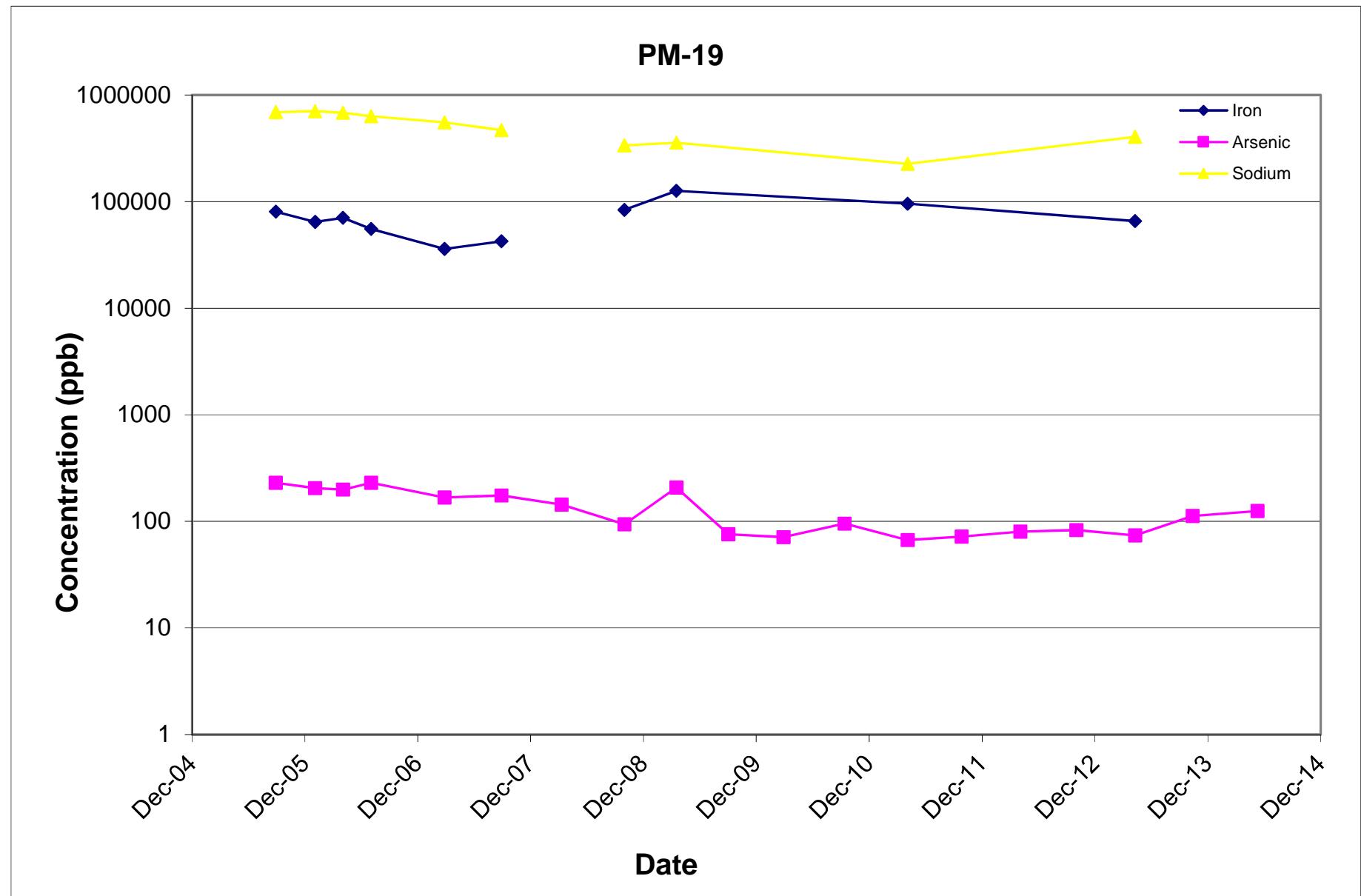
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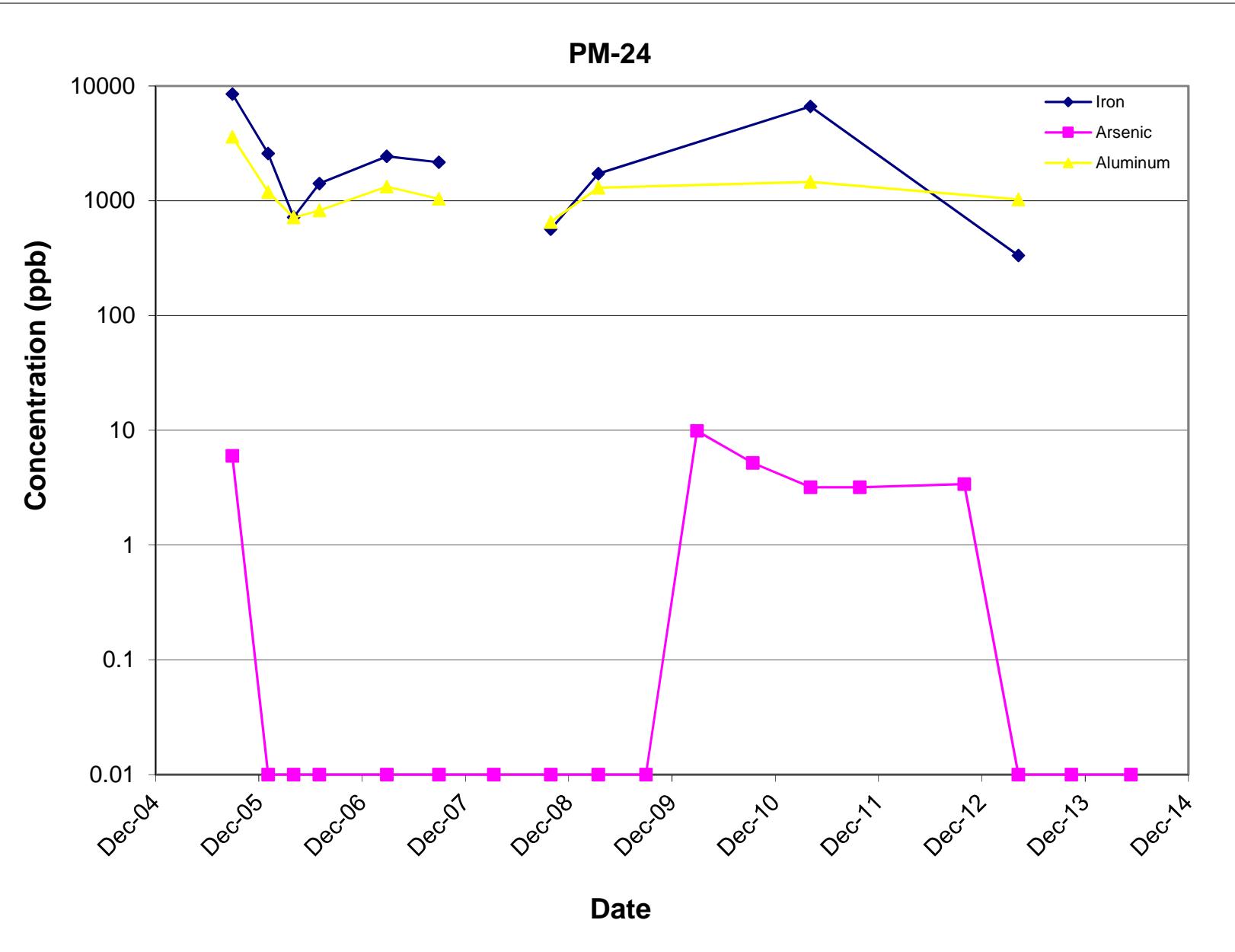


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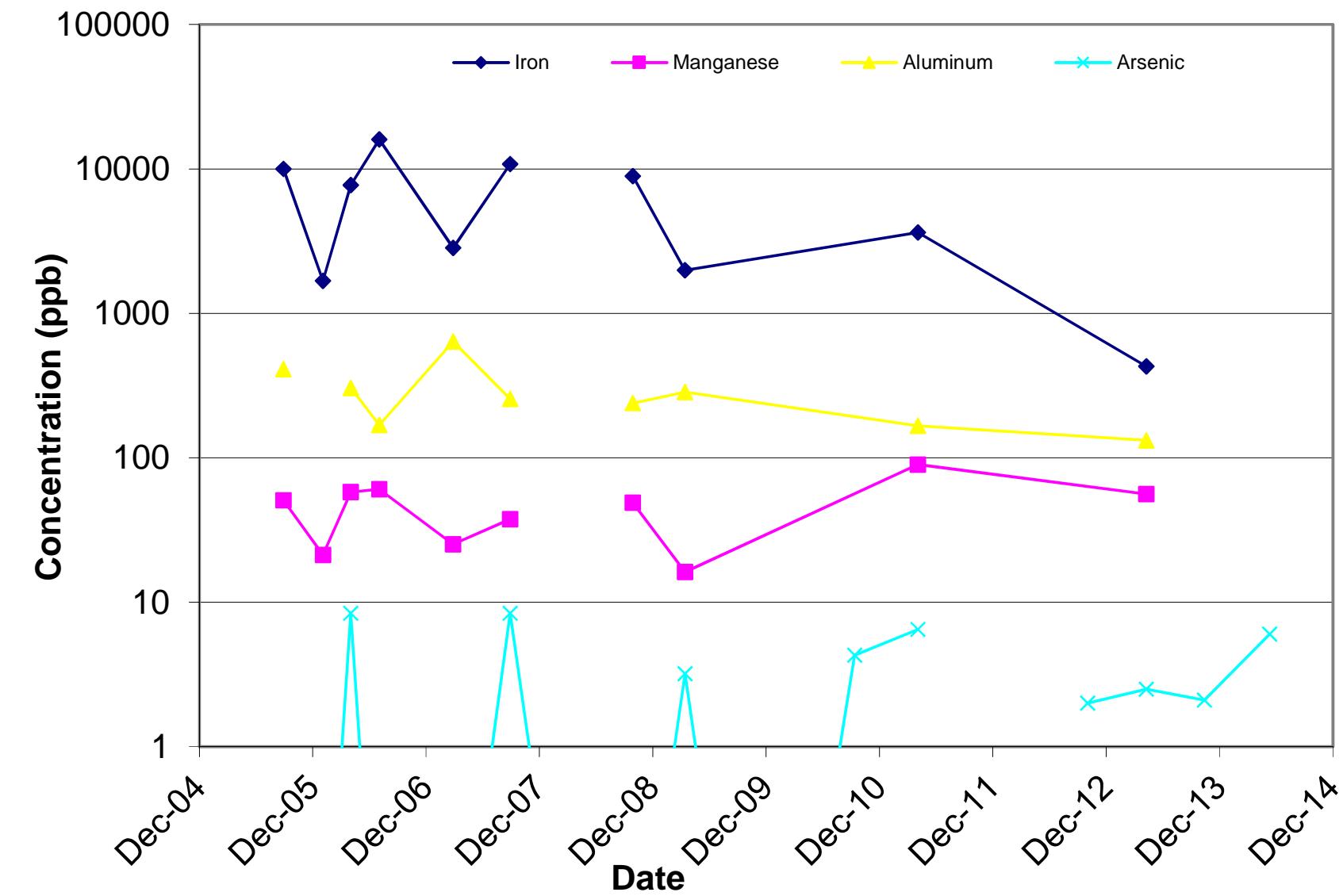




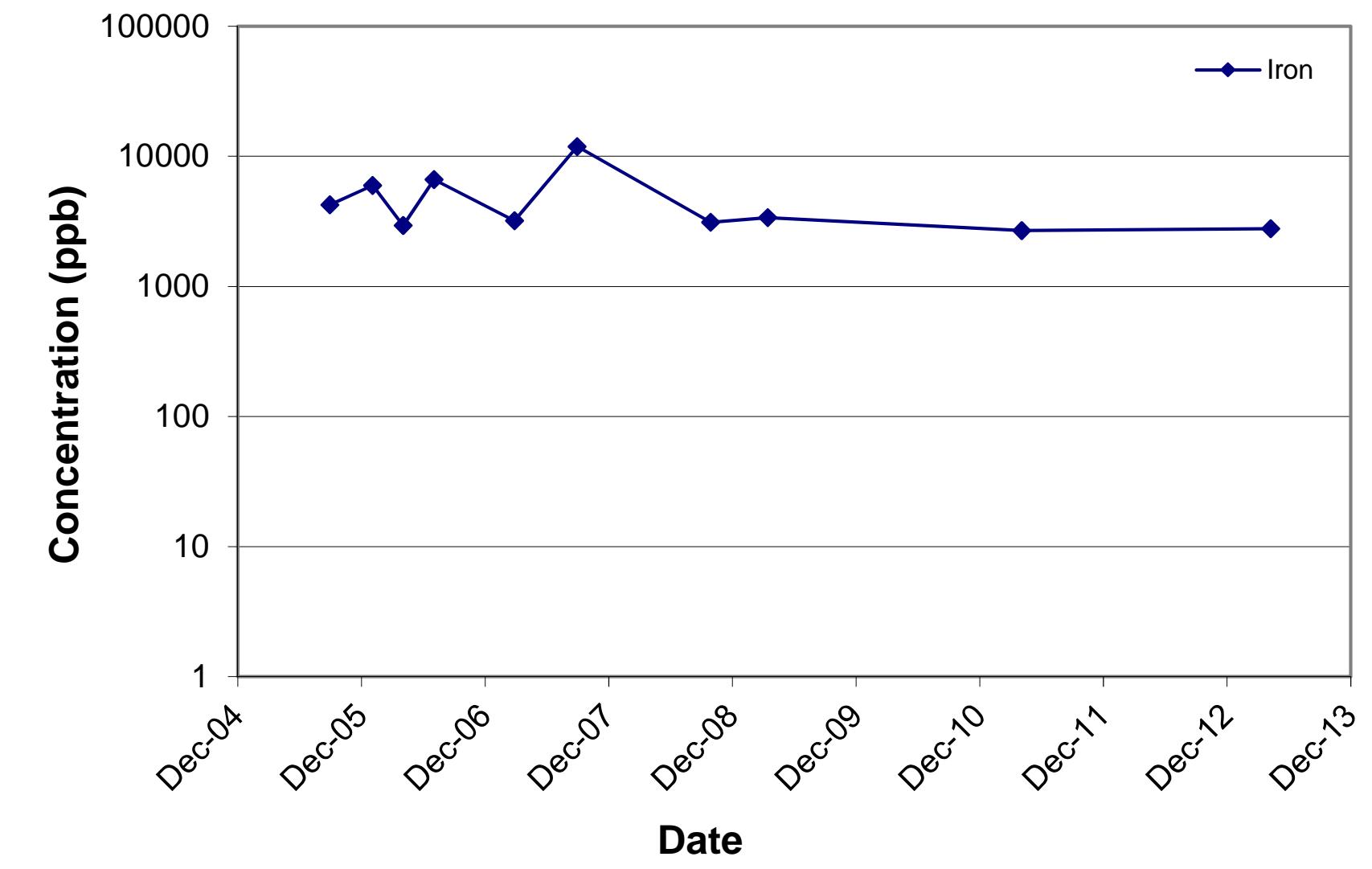


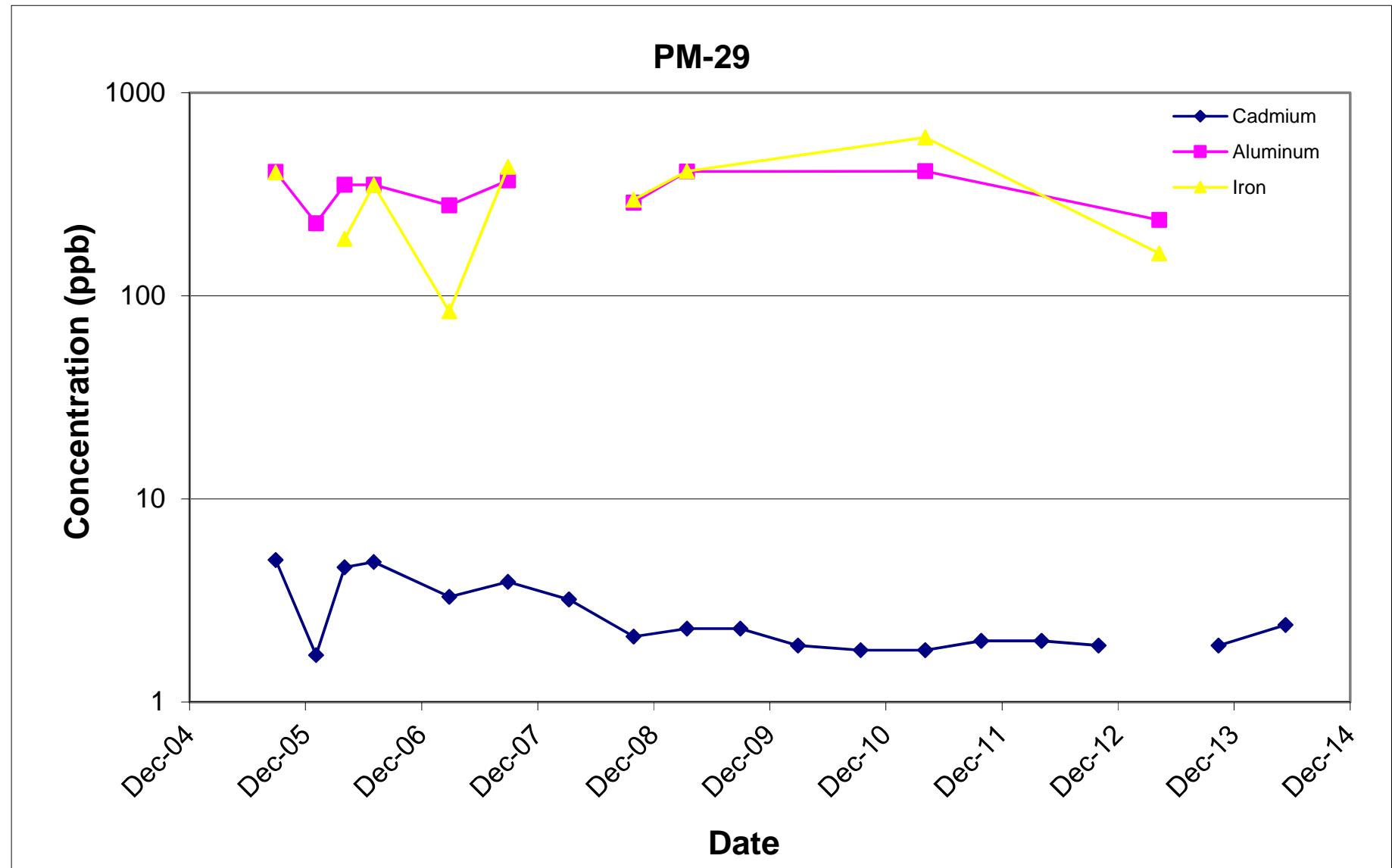


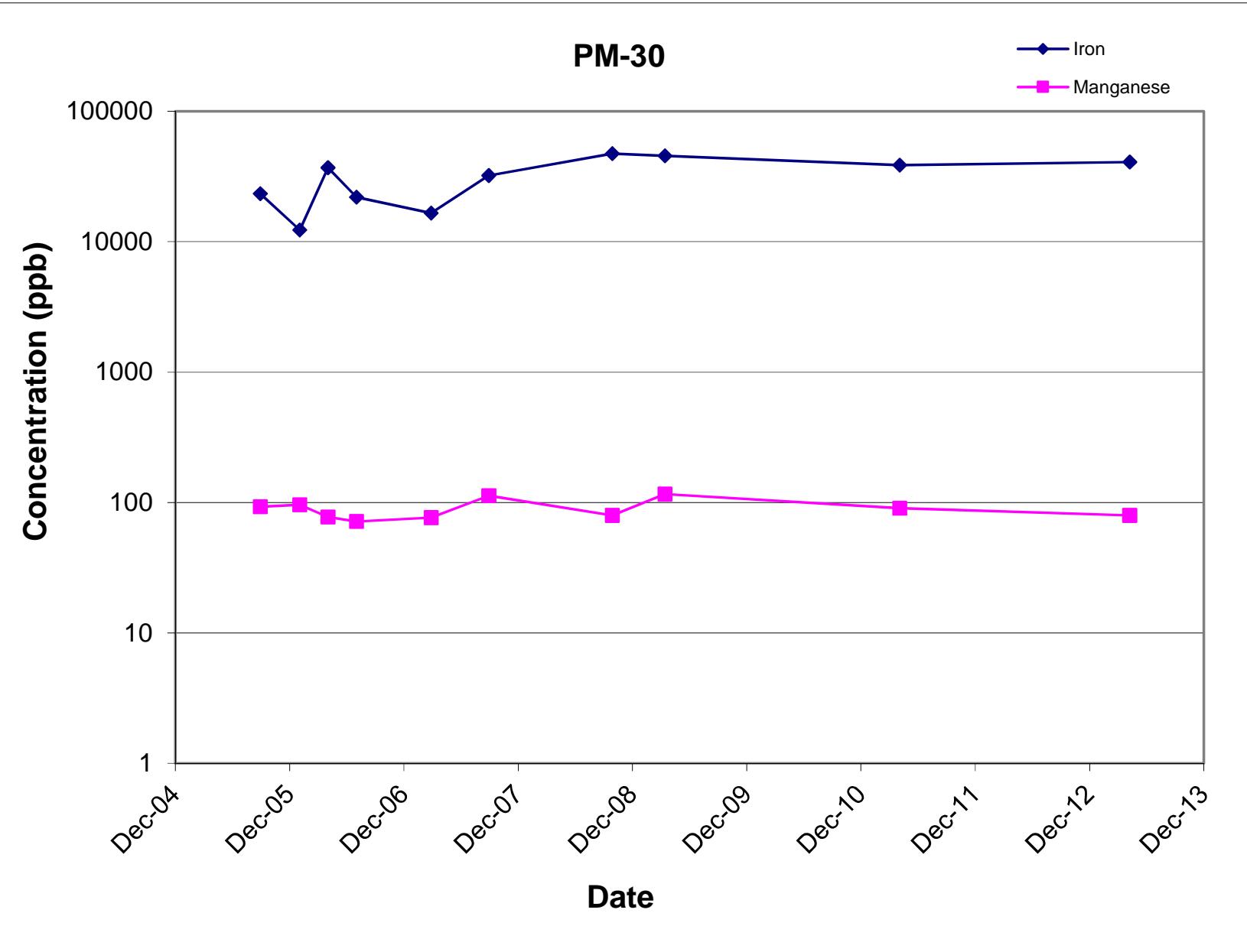
PM-25

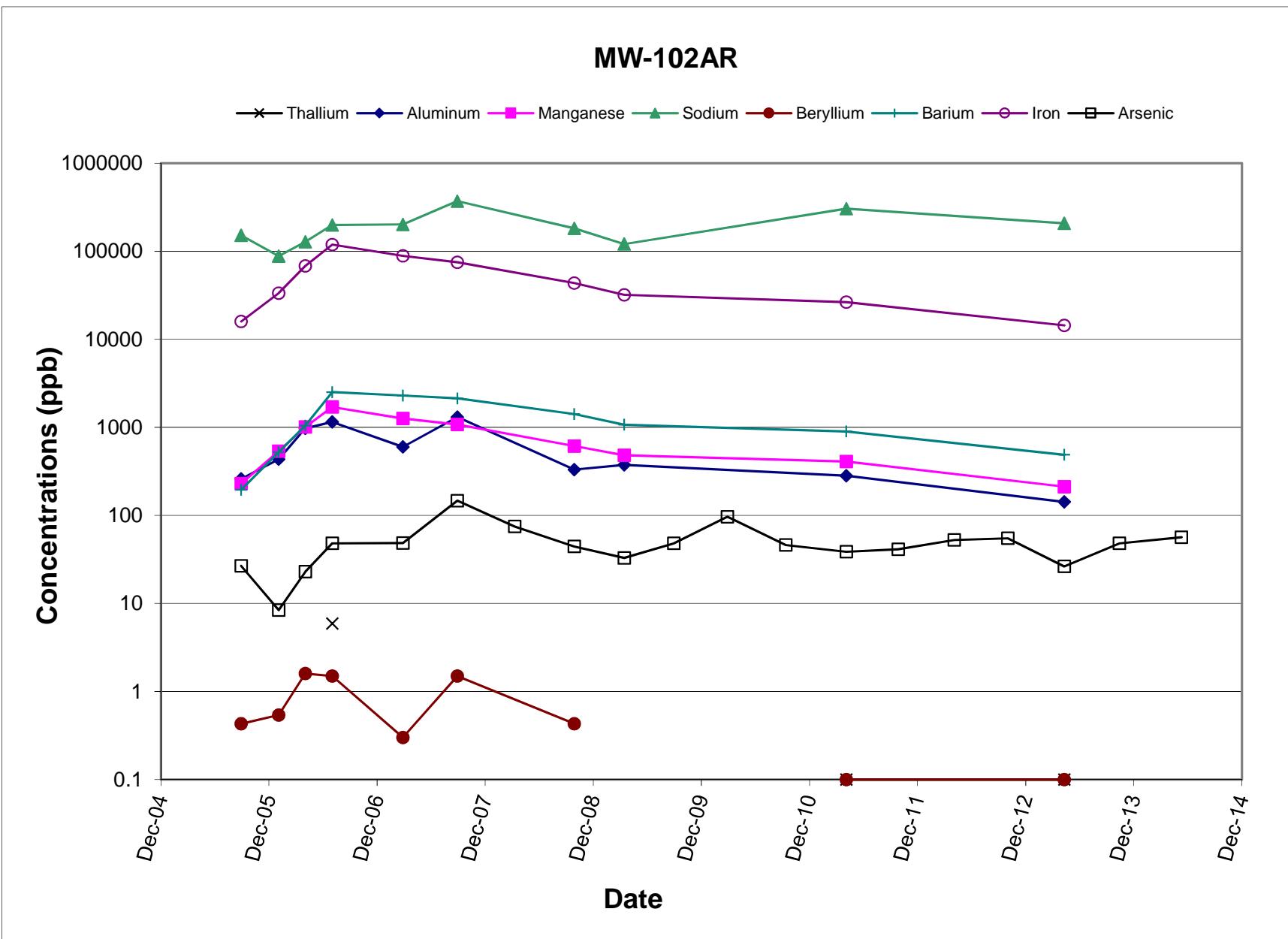


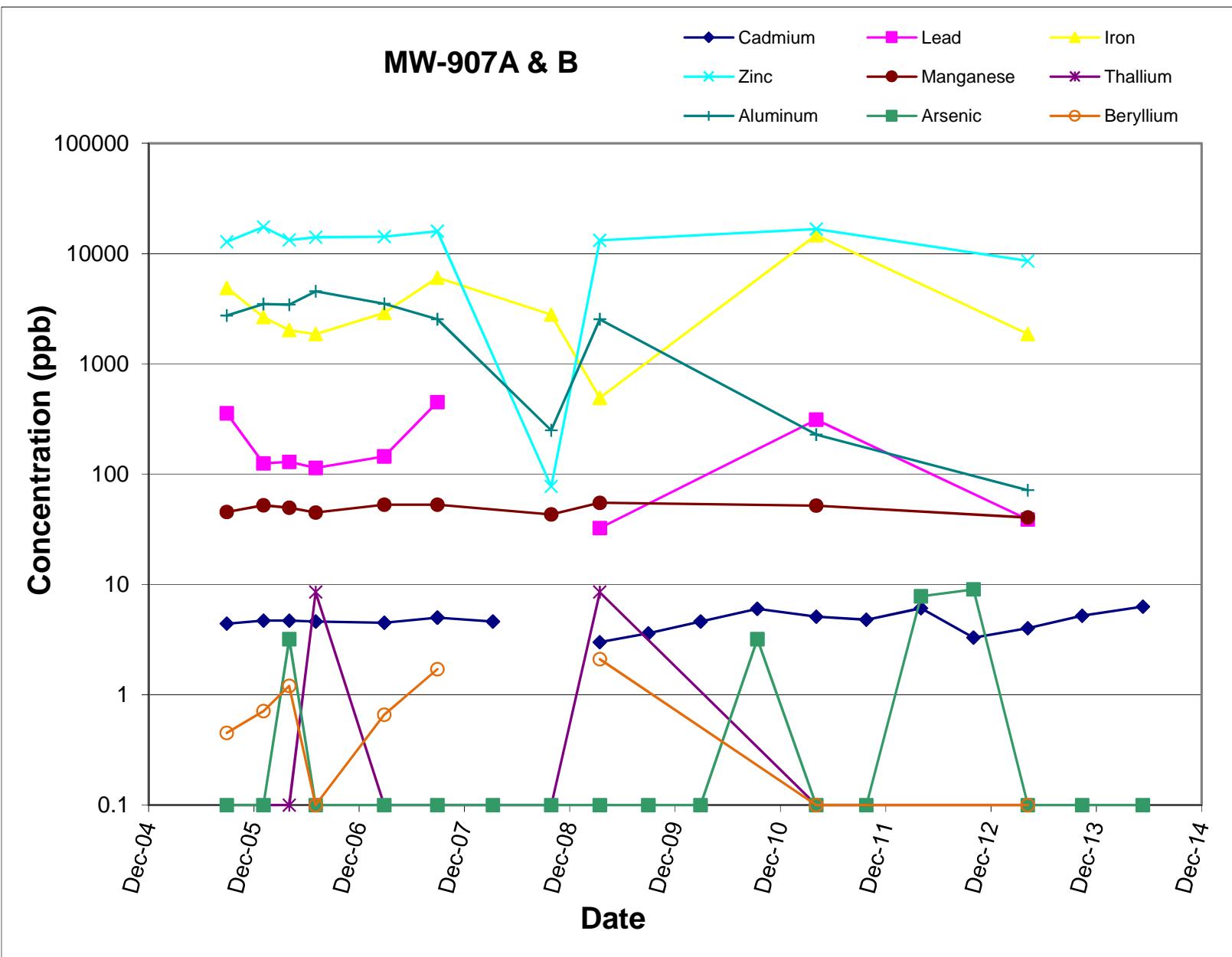
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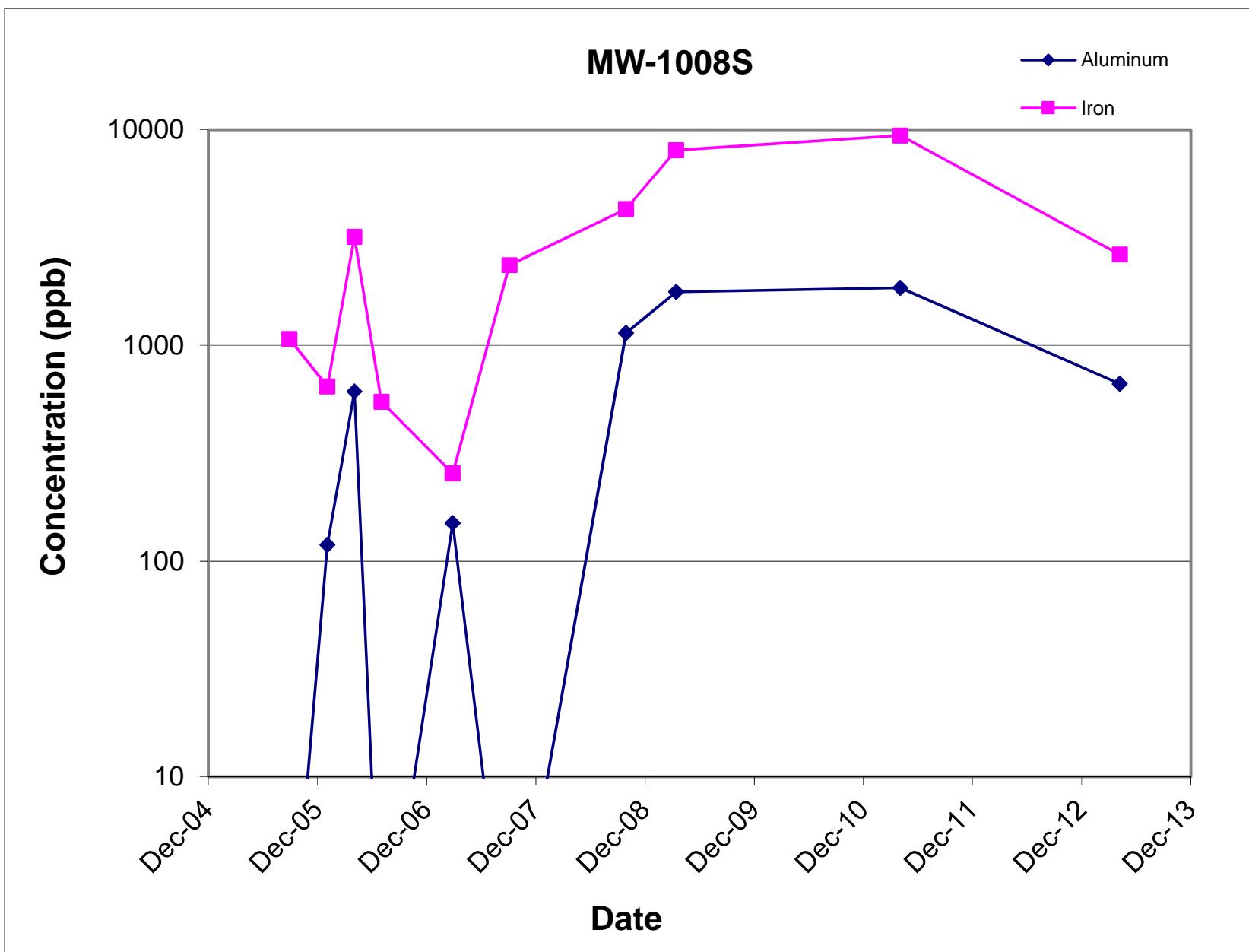




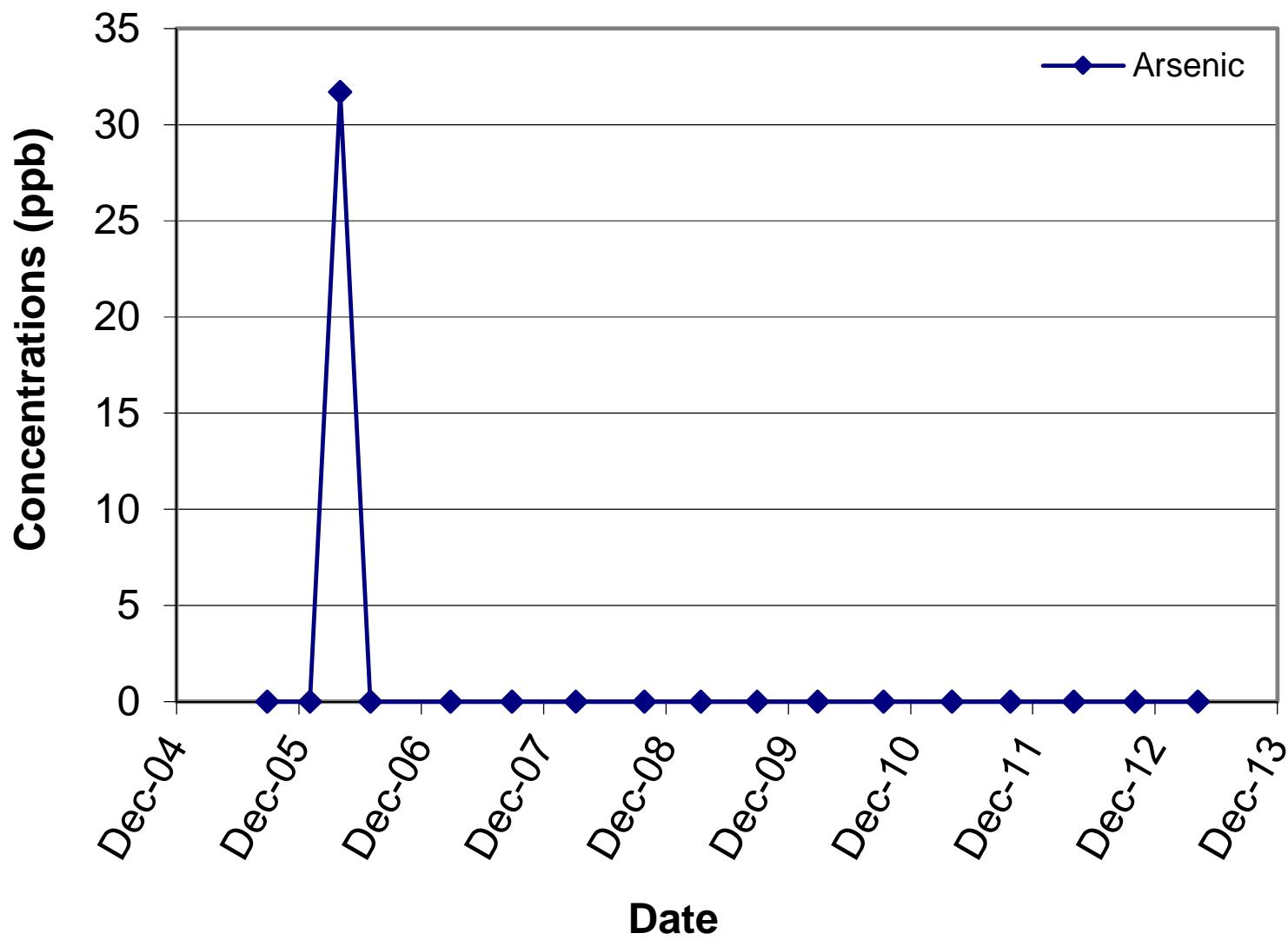








MW-1008D



APPENDIX D

GROUNDWATER QUALITY DATA REPORTS (PROVIDED ON CD)
